

**UNCLASSIFIED**

**53**

**AD-A041 400**

**DDC/BIB-77/06**

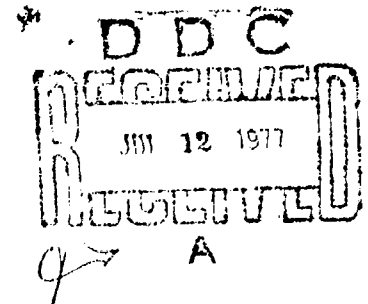
**ENVIRONMENTAL POLLUTION  
NOISE POLLUTION**

**SONIC BOOM**

**A DDC BIBLIOGRAPHY**

**DDC-TAS  
Cameron Station  
Alexandria, Va. 22314**

**JUNE 1977**



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**DEFENSE LOGISTICS AGENCY  
Cameron Station  
Alexandria, Va. 22314**

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This bibliography contains citations of studies and analyses covering a wide range of the parameter of sonic boom and noise pollution, as well as damages caused by it. Corporate Author-Monitoring Agency, Subject, Title and Personal Author are provided.		

DD FORM 1 JAN 73 1473

EDITION OF 1 NOV 65 IS OBSOLETE

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

(#19 Continued)

Shock Waves  
Jet Plane Noise  
Jet Aircraft  
Aircraft Noise  
Physiological Effects  
Reaction (Psychology)

## FOREWORD

This bibliography consists of 156 selected unclassified and unlimited citations of reports on *Noise Pollution - Sonic Boom*.

These citations are studies and analyses covering a wide range of the parameter of sonic boom and noise pollution, as well as damages caused by it.

References were taken from entries processed into the Defense Documentation Center's AD data bank during the period of January 1953 to March 1977.

This bibliography supersedes DDC report bibliography on *Environmental Pollution: Noise Pollution - Sonic Boom* AD-769 970, DDC-TAS-73-74, dated November 1973.

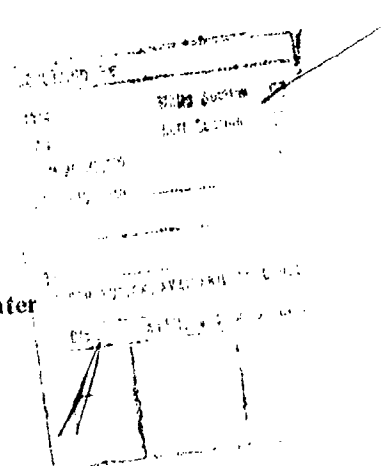
Individual entries are arranged in AD number sequence under the heading AD Bibliographic References. Computer generated indexes of Corporate Author-Monitoring Agency, Subject, Title and Personal Author are provided.

BY ORDER OF THE DIRECTOR, DEFENSE LOGISTICS AGENCY

OFFICIAL

*Hubert E. Sauter*

HUBERT E. SAUTER  
Administrator  
Defense Documentation Center





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TITLE . . . . .	T-1
PERSONAL AUTHQR . . . . .	P-1

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 229 463

ARDE-PORTLAND INC NEWARK N J

RESPONSE OF STRUCTURES TO AIRCRAFT GENERATED SHOCK  
WAVES

(U)

APR 59 138P

CONTRACT: AF33 616 5197

MONITOR: WADC TR-58-169

UNCLASSIFIED REPORT

DESCRIPTORS: \*SHOCK WAVES, \*STRUCTURES, \*TRANSONIC  
CHARACTERISTICS, FAILURE (MECHANICS),  
HOUSING(DWELLINGS), INSTALLATION, JET PLANE NOISE,  
PRESSURE, SONIC BOOM

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 260 635

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION WASHINGTON D  
C

GROUND MEASUREMENTS OF THE SHOCK-WAVE NOISE FROM  
SUPERSONIC BOMBER AIRPLANES IN THE ALTITUDE RANGE  
FROM 30,000 TO 50,000 FEET (U)

JUL 61 IV MAGLIERI, DOMENIC J.; HUBBARD, HARVEY  
H.;  
REPT. NO. TN D 880

UNCLASSIFIED REPORT

DESCRIPTORS: \*JET BOMBERS, \*LIFT, \*SHOCK WAVES,  
\*SUPERSONIC AIRCRAFT, AERODYNAMIC CHARACTERISTICS,  
BOMBER AIRCRAFT, GAS FLOW, MEASUREMENT, PRESSURE,  
TRANSONIC CHARACTERISTICS (U)

SHOCK-WAVE GROUND-PRESSURE MEASUREMENTS HAVE BEEN  
MADE FOR SUPERSONIC BOMBER AIRPLANES IN THE MACH  
NUMBER RANGE FROM 1.24 TO 1.52, FOR ALTITUDES FROM  
ABOUT 30,000 TO 50,000 FEET, AND FOR A GROSS-WEIGHT  
RANGE FROM ABOUT 83,000 TO 120,000 POUNDS. THE  
MEASURED OVERPRESSURES WERE GENERALLY HIGHER THAN  
WOULD BE PREDICTED BY THE THEORY WHICH ACCOUNTS ONLY  
FOR VOLUME EFFECTS. THERE IS THUS A SUGGESTION  
THAT LIFT EFFECTS ON SONIC-BOOM INTENSITY MAY BE  
SIGNIFICANT ON THIS TYPE OF AIRPLANE FOR THE  
ALTITUDE RANGE OF THE PRESENT TESTS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMU9

AD- 260 636

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION WASHINGTON D  
C

AN INVESTIGATION OF THE INFLUENCE OF LIFT ON SONIC-  
BOOM INTENSITY BY MEANS OF WIND-TUNNEL MEASUREMENTS  
OF THE PRESSURE FIELDS OF SEVERAL WING-BODY  
COMBINATIONS AT A MACH NUMBER OF 2.01

(U)

JUL 61 IV CARLSON, HARRY W.;  
REPT. NO. TN D 881

UNCLASSIFIED REPORT

DESCRIPTORS: \*LIFT, \*SHOCK WAVES, \*SOUND, \*SUPERSONIC  
FLOW, \*WING BODY CONFIGURATIONS, ACOUSTICS, AERODYNAMIC  
CHARACTERISTICS, AMPLIFIERS, PRESSURE, SONIC BOOM, WIND  
TUNNELS

(U)

AN INVESTIGATION OF THE EFFECT OF LIFT ON SONICBOOM  
INTENSITY WAS PERFORMED BY MEANS OF WINDTUNNEL  
MEASUREMENTS OF THE PRESSURE FIELDS SURROUNDING SMALL  
WING=BODY COMBINATIONS. EFFECTS OF LIFT WERE FOUND  
TO BE REAL AND SIGNIFICANT. MEASURED BOW-SHOCK  
INTENSITIES AGREED FAIRLY WELL WITH, BUT WERE  
CONSISTENTLY LESS THAN, SHOCK INTENSITIES ESTIMATED  
BY THEORETICAL METHODS. AVAILABLE FLIGHT DATA WERE  
EXAMINED FOR CORRELATION WITH WIND-TUNNEL TEST  
RESULTS. (AUTHOR)

(U)

UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMU9

AD- 292 658

FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

FLIGHT - EXPLOSION

(U)

NOV 62

IV

YUR'YEV, L.;

REPT. NO. TT 62 98

UNCLASSIFIED REPORT

DESCRIPTORS: \*BLUNT BODIES, AERODYNAMIC CHARACTERISTICS,  
AERODYNAMIC CONFIGURATIONS, ATMOSPHERE ENTRY, SHOCK  
WAVES, SONIC BOOM, SPIKES, SUPERSONIC FLOW, SWEEPBACK  
WINGS (U)

A STUDY WAS MADE OF A NEW METHOD OF STUDY AND  
CALCULATION OF THE MOTION OF SLENDER, BLUNT-FACED  
BODIES THROUGH AIR AND THE PROPAGATION OF EXPLOSIVE  
WAVES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMU9

AD- 404 562

FEDERAL AVIATION AGENCY WASHINGTON D C

COMMERCIAL SUPERSONIC TRANSPORT AIRCRAFT RESEARCH  
PROGRAM. SELECTED REFERENCES.

(U)

APR 63 38P  
MONITOR: FAA BLB

UNCLASSIFIED REPORT

DESCRIPTORS: \*TRANSPORT AIRCRAFT, \*SUPERSONIC,  
\*AIRFRAMES, \*FLIGHT CONTROL SYSTEMS, \*BIBLIOGRAPHIES,  
JET ENGINES, SONIC BOOM, SIMULATION, LUBRICATION, JET  
ENGINE FUELS, MATERIALS, DYNAMICS, METALS, JET  
PROPULSION, AIRCRAFT, STRUCTURAL PROPERTIES. (U)

BIBLIOGRAPHIES IN REFERENCE TO COMMERCIAL SUPERSONIC  
TRANSPORT AIRCRAFT.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMU9

AD- 408 716  
ARMY SIGNAL RADIO PROPAGATION AGENCY WHITE SANDS MISSILE  
RANGE N MEX

PROCEEDINGS OF THE SYMPOSIUM ON ATMOSPHERIC ACOUSTIC  
PROPAGATION, 14-16 JUNE, 1961, TEXAS WESTERN  
COLLEGE AND FORT BLISS, EL PASO, TEXAS. VOLUME 1. (U)

AUG 61 268P

UNCLASSIFIED REPORT

DESCRIPTORS: (\*ACOUSTICS, SYMPOSIA), (\*PROPA,  
ATMOSPHERES), SHOCK WAVES, FLIGHT PATHS, NOMUGRAPHS,  
ABSORPTION, BALLISTICS, DETERMINA, MICROPHONES, ACOUSTIC  
PROPERTIES, CON, THEORY, DATA, GEOMETRY, BLAST, NOISE,  
WAVE PROPAGATION, ELECTROMAGNETIC, SONIC BOOM,  
DETONATION WAVES, METEOROLOG, GUIDED MISSILES, WIND,  
TEMPERA, CAPACITORS, TELEMETER, CORRECTIONS, ARTILLERY  
FIRE, DATA, BACKGROUND, ANALYSIS, EXPLOSIONS. (U)

SYMPOSIA ON ATMOSPHERIC ACOUSTIC PROPAGATION.

UNCLASSIFIED

UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 720M09

AD- 422 294

AEROSPACE CORP EL SEGUNDO CALIF

NOTES ON THE DIFFRACTION OF BLASTS BY FLYING  
VEHICLES. PART ONE: GENERAL COMMENTS PART TWO: BLAST-  
WAVE, MACH-WAVE INTERACTION, (U)

AUG 63 1P MILES, J. W. ;  
REPT. NO. TDR269 4230 3U 1  
CONTRACT: AFD4 695 269  
MONITOR: SSD TDR63 195

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*AIRFOILS, BLAST), (\*SHOCK WAVES,  
DIFFRACTION), SUPERSONIC CHARACTERISTICS, AERODYNAMIC  
CONFIGURATIONS, WEDGES, SUPERSONIC FLOW, MATHEMATICAL  
ANALYSIS, SUPERSONIC AIRFOILS, MATRICES (MATHEMATICS),  
INTERFERENCE, SONIC BOOM, AERODYNAMIC LOADING (U)

WHITHAM'S TECHNIQUE FOR THE APPROXIMATE CALCULATION  
OF THE DIFFRACTION OF SHOCK WAVES BY STATIONARY  
BODIES IS APPLIED TO THE DIFFRACTION OF A BLAST WAVE  
BY A MACH WAVE THAT EMANATES FROM THE APEX OF A  
THIN WEDGE IN SUPERSONIC FLIGHT. THE APPROXIMATE  
RESULTS TEND TO THE EXACT RESULTS FOR WEAK BLAST  
WAVES BUT ARE UNSATISFACTORY FOR VERY STRONG BLAST  
WAVES. (AUTHOR) (U)



UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMU9

AD- 447 717

FEDERAL AVIATION AGENCY WASHINGTON D C

SONIC BOOM BIBLIOGRAPHY,

(U)

SEP 64 IIP FRIEDMAN, ROBERT K. :

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (•SONIC BOOM, BIBLIOGRAPHIES),  
(•BIBLIOGRAPHIES, SONIC BOOM), URBAN AREAS,  
ATTITUDES (PSYCHOLOGY), SUPERSONIC FLIGHT, TRANSPORT  
AIRCRAFT

(U)

THIS BIBLIOGRAPHY ON SONIC BOOM HAS BEEN COMPILED  
IN RESPONSE TO A SPECIFIC REQUEST. NO CLAIM IS  
MADE THAT THESE 193 CITATIONS COMPRISE AN EXHAUSTIVE  
OR CRITICAL COMPILATION. THE INCLUSION OF ANY  
REFERENCE TO MATERIAL IS NOT TO BE CONSTRUED AS AN  
ENDORSEMENT OF THE INFORMATION CONTAINED IN THAT  
MATERIAL. THE REFERENCE SEARCH WAS COMPLETED  
AUGUST 28, 1964. (AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 464 647

LIBRARY OF CONGRESS WASHINGTON D C AEROSPACE TECHNOLOGY  
DIV

DATA ON SOVIET SPACE PROGRAM.

(U)

DESCRIPTIVE NOTE: ANALYTICAL SURVEY OF SOVIET-BLOC  
SCIENTIFIC AND TECHNICAL LITERATURE.

JUN 65 16P

REPT. NO. ATD-P-65-37

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*ASTRONAUTICS, USSR), (\*AERONAUTICS,  
USSR), SPACE BIOLOGY, SUPERSONIC AIRCRAFT, HYPERSONIC  
AIRCRAFT, SONIC BOOM, JET TRANSPORT PLANES, SPACECRAFT,  
LUNAR CRAFT, MANNED SPACECRAFT, ADJUSTMENT (PSYCHOLOGY),  
SPACE ENVIRONMENTS, CONFINED ENVIRONMENTS, PHYSIOLOGY,  
MEASUREMENT, WEIGHTLESSNESS, SPACE CAPSULES (U)  
IDENTIFIERS: SUPERSONIC TRANSPORTS, VOSKHOD (U)

CONTENTS: SPACE BIOLOGY; SUPERSONIC  
AIRCRAFT; HYPERSONIC AIRCRAFT; THE SONIC  
BOOM; SOVIET OFFICIALS ON SST; THE  
VOSKHOD SPACECRAFT; SOVIET EXPLORATION OF THE  
MOON.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZUMU9

AD- 468 794

FEDERAL AVIATION AGENCY WASHINGTON D C

EFFECT OF SONIC BOOMS OF VARYING OVERPRESSURES ON  
SNOW AVALANCHES. (U)

65 33P  
REPT. NO. SST-65-9

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH FOREST  
SERVICE, WASHINGTON, D. C., DEPARTMENT OF THE AIR  
FORCE, WASHINGTON, D. C. AND NATIONAL AERONAUTICS  
AND SPACE ADMINISTRATION, WASHINGTON, D. C.

DESCRIPTORS: (\*SONIC BOOM, AVALANCHES), (\*AVALANCHES,  
SONIC BOOM), SNOW, PRESSURE, SUPERSONIC AIRCRAFT,  
HAZARDS, COLORADO, NOISE, JET FIGHTERS (U)  
IDENTIFIERS: F-100 AIRCRAFT, F-104 AIRCRAFT,  
OVERPRESSURE (U)

ON 18 - 20 MARCH 1965, A SONIC BOOM PROGRAM WAS  
CONDUCTED IN THE STAN MOUNTAIN AREA NEAR  
LEADVILLE, COLORADO, IN THE SAN ISABEL  
NATIONAL FOREST. OBJECTIVE WAS TO DETERMINE  
THE EFFECTS OF SONIC BOOM OVERPRESSURES ON SNOW  
AVALANCHES. A TOTAL OF 18 COMBINED F-104 AND F-  
100 RUNS WERE MADE WITH OVERPRESSURES RANGING FROM  
1.5 TO 5.2 MEASURED. NO AVALANCHE WAS OBSERVED AS  
A DIRECT RESULT OF THE SONIC BOOMS. FOREST  
SERVICE PERSONNEL RATED THE AVALANCHE HAZARD AS  
'LOW' DURING THE TEST PERIOD, RESULTING IN THE  
RECOMMENDATION FOR FURTHER TESTS DURING PERIODS OF  
'HIGH' AVALANCHE HAZARD. (AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 474 778 20/1

BLUME (JOHN A) AND ASSOCIATES SAN FRANCISCO CALIF RESEARCH  
DIV

REPORT ON THE NATIONAL SONIC BOOM STUDY STRUCTURAL  
REACTION PROGRAM. SUMMARY, CONCLUSIONS, AND  
ANALYSIS. VOLUME 1. (U)

APR 65 179P

CONTRACT: FA-SS-65-12

MONITOR: FAA-SST 65-15-VOL-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 2, AD-474  
779L.

DESCRIPTORS: (\*SONIC BOOM, \*BUILDINGS), TEST METHODS,  
STATE-OF-THE-ART REVIEWS, DESIGN, NEW MEXICO, DAMAGE,  
PRESSURE, WALLS, FRACTURE(MECHANICS),  
FOUNDATIONS(STRUCTURES), CONSTRUCTION, METEOROLOGICAL  
PHENOMENA, JET FIGHTERS, JET BOMBERS, BRICK, WOOD,  
PREFABRICATED BUILDINGS, JET TRANSPORT PLANES,  
SUPERSONIC AIRCRAFT, LOADS(FORCES), CONCRETE, GLASS,  
STRUCTURAL MEMBERS, SHOCK WAVES, STRUCTURES (U)  
IDENTIFIERS: B-58 AIRCRAFT, F-104 AIRCRAFT, SUPERSONIC  
TRANSPORTS (U)

CONTENTS: SURVEY OF LITERATURE -- SONIC  
BOOM, AIR BLAST AND RELATED PHENOMENA,  
GENERAL BEHAVIOR OF STRUCTURAL ELEMENTS  
UNDER STATIC AND DYNAMIC LOADS, CROSS  
SECTIONAL SURVEY OF HOUSE TYPES IN THE  
UNITED STATES, NATURAL LOADING CONDITIONS  
THROUGHOUT THE UNITED STATES, BUILDING  
CODES; TEST PLAN -- SITE SELECTION,  
DESIGN OF NEW TEST STRUCTURES, STRUCTURAL  
MODULES, PREFAB, STPREFRONT AND GREENHOUSE,  
EXISTING STRUCTURES OBSERVED IN TEST, DAMAGE  
OBSERVATION PLAN, INSTRUMENTATION, DATA  
REDUCTION AND ANALYSIS; SPECIAL TESTS --  
MATERIAL TESTS, FOUNDATION MATERIALS  
EVALUATION, LOAD-DEFLECTION AND 'TWANG'  
TESTS; OBSERVED STRUCTURAL BEHAVIOR --  
LOADING CONDITIONS, PARAMETERS, PLASTER ON  
WOOD LATH, PLASTER ON GYPLATH; METAL LATH  
AND CONCRETE BLOCK, GYPBOARD, BATHROOM  
TILE, GLASS, STUCCO, CONCRETE BLOCK,  
BRICK, BRIC-A-BRAC; ANALYSIS OF STRUCTURAL  
BEHAVIOR -- LOAD MODIFICATION STUDIES,  
STRUCTURAL RESPONSE,

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMU9

AD- 474 779 20/1  
BLUME (JOHN A) AND ASSOCIATES SAN FRANCISCO CALIF RESEARCH  
DIV

STRUCTURAL REACTION PROGRAM. NATIONAL SONIC BOOM  
STUDY PROJECT. VOLUME 2.

(U)

APR 65 234P  
CONTRACT: FA-55-65-12  
MONITOR: FAA-55T 65-15-VOL-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 1, AD-474  
778L.

DESCRIPTORS: (\*SONIC BOOM, \*BUILDINGS), DESIGN,  
SPECIFICATIONS, NEW MEXICO, BIBLIOGRAPHIES, PRESSURE,  
JET FIGHTERS, JET BOMBERS, TABLES(DATA), DAMAGE, SHOCK  
WAVES, STRUCTURAL MEMBERS, JET TRANSPORT PLANES,  
SUPERSONIC AIRCRAFT, PREFABRICATED BUILDINGS,  
STRUCTURES (U)  
IDENTIFIERS: B-58 AIRCRAFT, F-104 AIRCRAFT, SUPERSONIC  
TRANSPORTS (U)

THE TWO VOLUMES OF THIS REPORT DESCRIBES THE  
RESULTS OF THE NATIONAL SONIC BOOM STRUCTURAL  
RESPONSE STUDY CONDUCTED AT THE WHITE SANDS  
MISSILE RANGE, WHITE SANDS, N.M. IT IS ONE  
OF THE ONGOING SERIES OF SONIC BOOM RESEARCH  
PROGRAMS CONDUCTED BY THE GOVERNMENT IN THE  
SUPERSONIC TRANSPORT DEVELOPMENT PROGRAM.  
THE PRIMARY OBJECTIVE WAS DETERMINATION OF SONIC  
BOOM OVERPRESSURE DAMAGE INDEX LEVELS ASSOCIATED WITH  
VARIOUS TYPES OF STRUCTURAL MATERIAL SUCH AS PLASTER,  
GLASS AND MASONRY. THE TEST AREA INCLUDED 21  
STRUCTURES VARYING IN DESIGN, CONSTRUCTION AND AGE.  
FURNITURE, MIRRORS, TELEVISION SETS AND OTHER HOME  
APPLIANCES, DISHES, CRYSTAL, BRIC-A-BRAC AND VARIOUS  
OTHER ITEMS WERE IN THE TEST STRUCTURES. THE TEST  
SITE WAS EXPOSED TO 1494 SONIC BOOMS OF OVERPRESSURES  
RANGING FROM 1.6 TO 23.4 POUNDS PER SQUARE FOOT  
(P.S.F.). SONIC BOOMS AND STRUCTURAL MATERIAL  
REACTION WERE MEASURED. TO STUDY THE CUMULATIVE  
EFFECTS OF REPEATED SONIC BOOMS, 680 SUCCESSIVE  
FLIGHTS AT A SCHEDULED OVERPRESSURE OF 5.0 P.S.F.  
IT IS CONCLUDED THAT NO PREVIOUSLY UNDAMAGED  
MATERIAL WAS IDENTIFIED DURING THE ACCUMULATIVE  
EFFECTS PORTION OF THE STUDY. SONIC BOOM  
OVERPRESSURE LEVELS AT WHICH INCIDENT EFFECTS APPEAR  
IN STRUCTURES AND MATERIALS ARE PRESENTED.  
(AUTHOR)

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 475 662 20/1 13/13  
BLUME (JOHN A) AND ASSOCIATES SAN FRANCISCO CALIF RESEARCH  
DIV

THE EFFECTS OF SONIC BOOM ON STRUCTURAL BEHAVIOR. A  
SUPPLEMENTARY ANALYSIS REPORT. (U)

DESCRIPTIVE NOTE: FINAL REPT.,  
OCT 65 192P WIGGINS, JOHN H. JR.;  
CONTRACT: FA-SS-65-12  
MONITOR: FAA-SST 65-18

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, \*BUILDINGS), RESPONSE,  
DAMAGE, OKLAHOMA, NEW MEXICO, SHOCK WAVES, STATISTICAL  
DISTRIBUTIONS, STATISTICAL ANALYSIS, DAMAGE ASSESSMENT,  
LOADS(FORCES), INTENSITY, REFLECTION, PRESSURE,  
MATHEMATICAL PREDICTION, STRUCTURES, RESONANT FREQUENCY,  
DAMPING, RESONANCE, WALLS, SOILS, ALTITUDE, TIME,  
THEORY, VIBRATION, STRESSES, DEFLECTION, GLASS,  
STRUCTURAL PROPERTIES, FRACTURE(MECHANICS),  
METEOROLOGICAL PHENOMENA, JET FIGHTERS, JET BOMBERS (U)  
IDENTIFIERS: B-58 AIRCRAFT, F-104 AIRCRAFT, F-106  
AIRCRAFT (U)

RESPONSE AND DAMAGE DATA FROM THE FEDERAL  
AVIATION AGENCY SONIC BOOM TESTS AT  
OKLAHOMA CITY, OKLAHOMA, AND WHITE SANDS,  
NEW MEXICO, ARE ANALYZED AND EFFECTS ON  
STRUCTURES SUMMARIZED. PARAMETERS GOVERNING THE  
FREE-FIELD AND NEAR-FIELD BOOM WAVES ARE ALSO STUDIED  
AND THEIR INFLUENCE ON SCATTER IN THE DATA ESTIMATED  
STATISTICALLY. THIS REPORT THEN CONSERVATIVELY  
SUMMARIZES THE RESULTS IN A DAMAGE PREDICTION TABLE  
AND CHART. INSURANCE ADJUSTERS ARE GIVEN GUIDANCE  
ON THE TREATMENT OF SONIC BOOM DAMAGE CLAIMS ALONG  
WITH THE CHART. FINALLY, RECOMMENDATIONS FOR  
FUTURE WORK IN SONIC BOOM, STRUCTURAL BEHAVIOR  
STUDIES ARE MADE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 479 366 20/1 4/2 1/1  
WEATHER WING (6TH) ANDREWS AFB WASHINGTON D C

SONIC BOOM.

(U)

FEB 66 43P  
REPT. NO. 6WWP-105-1-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SUPERSEDES REPT. NO. 4WGP-105-1-1  
DATED 1 JUL 60.

DESCRIPTORS: (SONIC BOOM, \*METEOROLOGICAL PHENOMENA),  
MEASUREMENT, SOUND, PROPAGATION, ATMOSPHERES, SUPERSONIC  
FLIGHT, PRESSURE, SHOCK WAVES, MATHEMATICAL ANALYSIS,  
VELOCITY, FLIGHT PATHS, TRAJECTORIES, TROPOSPHERE, WIND,  
ATMOSPHERIC TEMPERATURE, TNT, TEST METHODS, SUPERSONIC  
WIND TUNNELS, BOMBER AIRCRAFT, FIGHTER AIRCRAFT,  
AIRPLANE MODELS, ROCKETS, LAUNCH VEHICLES, NOISE,  
SUPERSONIC CHARACTERISTICS, SOUND TRANSMISSION (U)  
IDENTIFIERS: SATURN LAUNCH VEHICLES (U)

BECAUSE THERE ARE IMPORTANT METEOROLOGICAL EFFECTS  
ON SHOCK WAVE PROPAGATION, WEATHER OFFICERS SHOULD  
BECOME ACQUAINTED WITH SOME OF THE TERMINOLOGY AND  
THE PHYSICAL PRINCIPLES OF WEATHER EFFECTS ON SONIC  
BOOM PROPAGATION. CALCULATION OF SHOCK WAVE  
PATTERNS COVERING MANY SQUARE MILES IS AN EXCEEDINGLY  
COMPLEX OPERATION WHICH INVOLVES SEVERAL PARAMETERS  
OTHER THAN WEATHER DATA. SONIC BOOMS CAUSED BY  
EITHER AIRCRAFT OR MISSILES ARE INFLUENCED BY SIZE,  
SHAPE, SPEED, TRAJECTORY, ETC. THE USE OF  
EQUATIONS TO COMBINE THE EFFECTS OF SUCH A LARGE  
NUMBER OF VARIABLES CAN ONLY GIVE RESULTS IN TERMS OF  
SIMPLIFIED CONDITIONS. ACTUAL MEASUREMENTS MADE IN  
FIELD TESTS SHOW A RATHER BROAD RANGE OF VALUES  
SURROUNDING THOSE DERIVED FROM MATHEMATICAL  
CALCULATION. IN THIS REPORT, NO ATTEMPT WILL BE  
MADE TO PRESENT THE MATHEMATICAL TREATMENTS REQUIRED  
BY THOSE WHO CALCULATE EXPECTED SONIC BOOMS WITH THE  
AID OF ELECTRONIC COMPUTERS. CURRENT KNOWLEDGE OF  
THE EFFECT OF WEATHER PARAMETERS ON SONIC BOOM HAS  
BEEN GAINED PRIMARILY FROM LIMITED ATMOSPHERIC  
MEASUREMENT MADE NEAR THE TIME AND LOCATION OF  
PLANNED SONIC BOOM TESTS. METEOROLOGISTS ARE BEING  
ASKED TO EXAMINE AND HELP EXPLAIN THE RATHER WIDE  
VARIABILITY IN THE OBSERVED SONIC BOOM PRESSURES  
BEING MEASURED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMU9

AD- 601 688

FEDERAL AVIATION AGENCY WASHINGTON D C

SUPERSONIC TRANSPORT DEVELOPMENT PROGRAM.

(U)

JUN 63 67P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*SUPERSONIC AIRCRAFT, AIR TRANSPORTATION),  
(\*COMMERCIAL PLANES, AIR TRANSPORTATION PRODUCTION),  
DESIGN, ECONOMICS, COSTS, COMMERCE, SPEED, SONIC BOOM,  
ALUMINUM, STEEL, TITANIUM, MONEY, MANAGEMENT  
ENGINEERING, PERSONNEL, AIRFRAMES, JET ENGINES, PAY  
LOAD (U)

THIS REPORT DESCRIBES THE PROGRAM FOR THE  
DEVELOPMENT OF A COMMERCIAL SUPERSONIC TRANSPORT  
AIRCRAFT AS APPROVED BY THE PRESIDENT. TOPICS  
INCLUDE SUPERSONIC TRANSPORT AND THE NATIONAL  
INTEREST, FOREIGN COMPETITION, MARKET POTENTIAL FOR  
THE SUPERSONIC TRANSPORT, DESIGN CONSIDERATIONS FOR A  
UNITED STATES SUPERSONIC TRANSPORT, FACTORS  
INFLUENCING DESIGN SPEED, SONIC BOOM, SUPERSONIC  
TRANSPORT OPERATING ECONOMICS, DEVELOPMENT PROGRAM,  
PRODUCTION PROGRAM, ESCALATION OF DEVELOPMENT AND  
PRODUCTION COSTS, OTHER TECHNICAL CONSIDERATIONS,  
MANAGEMENT ORGANIZATION. (U)



UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMU9

AD- 602 173

FEDERAL AVIATION AGENCY WASHINGTON D C

SOME CONSIDERATIONS OF SONIC BOOM.

(U)

DESCRIPTIVE NOTE: SUMMARY REPT.,

MAY 61 29P POWER, J. KENNETH ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*SONIC BOOM, THEORY), JET PLANE NOISE,  
LIFT, VOLUME, SHOCK WAVES, PRESSURE, SUPERSONIC  
AIRCRAFT, PRESSURE, ATMOSPHERIC TEMPERATURE, EQUATIONS,  
FLUID DYNAMICS, PUBLIC RELATIONS, FLIGHT TESTING (U)  
IDENTIFIERS: OVERPRESSURE (U)

CONTENTS: BASIC PHENOMENA DISCUSSION,  
THEORETICAL CONSIDERATIONS, LIFTING EFFECTS, FLIGHT  
TEST--COMPARISON WITH THEORY, GENERAL CONSIDERATIONS  
OF NOISE, SONIC BOOM--POINT SOURCE EXPLOSIONS,  
PREDICTION OF EFFECTS OF SONIC BOOM OVERPRESSURES,  
SHOCK WAVE NOISE PROBLEMS OF FUTURE SUPERSONIC  
TRANSPORT AIRCRAFT, AVAILABLE REFERENCES ON SONIC  
BOOM. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMU9

AD- 602 175

FEDERAL AVIATION AGENCY WASHINGTON D C

SONIC BOOM EFFECTS ON LIGHT AIRCRAFT HELICOPTERS AND  
GROUND STRUCTURES. (U)

DESCRIPTIVE NOTE: REPT. FOR 3 FEB-10 APR 64,  
JUN 64 44P POWER, JOSEPH KENNETH I

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: FOR PRESENTATION TO THE AMERICAN  
SOCIETY FOR TESTING AND MATERIALS, CHICAGO, ILL.,  
JUNE 25, 1964.

DESCRIPTORS: (\*SONIC BOOM, DAMAGE), METEOROLOGICAL  
PHENOMENA, SOUND, SHOCK WAVES, PRESSURE, HELICOPTERS,  
AIRCRAFT, TESTS, HOUSING(DWELLINGS) (U)  
IDENTIFIERS: OVERPRESSURE (U)

SONIC BOOM EFFECTS ON LIGHT AIRCRAFT HELICOPTERS AND  
GROUND STRUCTURES.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 602 176

FEDERAL AVIATION AGENCY WASHINGTON D C

SONIC BOOM AND COMMUNITY RELATIONS,

(U)

APR 64 40P POWER, J. K. BATES, GEORGE I

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE NATIONAL AERONAUTICAL MEETING, WASHINGTON, D. C. APRIL 8-11, 1963. SOCIETY OF AUTOMOTIVE ENGINEERS, INC., PAPER NO. 683B

DESCRIPTORS: (\*SONIC BOOM, DAMAGE), SUPERSONIC FLIGHT, HUMANS, SUPERSONIC AIRCRAFT, LIFT, VOLUME, SHOCK WAVES, METEOROLOGICAL PHENOMENA, PRESSURE, DESIGN, SOUND, COMMERCIAL PLANES, PUBLIC OPINION (U)

SOME PRELIMINARY ACCOMPLISHMENTS OF SONIC BOOM RESEARCH IN PREDICTING STRENGTH AND LOCATION OF SONIC BOOM SHOCK WAVES, DETERMINING THE EFFECTS ON LIGHT AIRCRAFT, AND EVALUATING COMMUNITY TOLERANCE TO VARIOUS LEVELS OF SONIC BOOM INTENSITY ARE REVIEWED. A BRIEF SUMMARY OF THE IMPLICATIONS OF SONIC BOOM WITH REGARD TO SUPERSONIC TRANSPORT DESIGN IS INCLUDED. (U)

UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMU9

AD- 610 463

BOEING CO RENTON WASH AIRPLANE DIV

METEOROLOGICAL ASPECTS OF THE SONIC BOOM.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,

SEP 64 143P

KANE, EDWARD J. ; PALMER,

THOMAS Y. ;

CONTRACT: FA WA4717

PROJ: 206 003R

MONITOR: FAA ,

RD64 160

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*SONIC BOOM, METEOROLOGICAL PHENOMENA),  
(\*METEOROLOGICAL PHENOMENA, SONIC BOOM), (\*LEVEL FLIGHT,  
SONIC BOOM), ATMOSPHERES, METEOROLOGICAL PHENOMENA,  
ATMOSPHERIC TEMPERATURE, PRESSURE, WIND, TURBULENCE,  
SUPERSONIC FLIGHT, SHOCK WAVES, PROPAGATION, OKLAHOMA,  
FOCUSING (U)

IDENTIFIERS: B-58 AIRCRAFT, F-104 AIRCRAFT, F-101  
AIRCRAFT (U)

THIS REPORT IS A STUDY OF THE EFFECT OF CHANGING  
METEOROLOGICAL CONDITIONS ON THE SONIC BOOM PRODUCED  
DURING STEADY LEVEL FLIGHT. THE INFLUENCE OF  
VARIATIONS IN ATMOSPHERIC TEMPERATURE, PRESSURE, AND  
WIND ON THIS NOISE ARE INVESTIGATED. SIMPLIFIED  
METHODS ARE ESTABLISHED FOR ESTIMATING THE EFFECT OF  
THESE VARIATIONS. COMBINATIONS OF METEOROLOGICAL  
CONDITIONS WHICH CAN PRODUCE ANOMALOUS PROPAGATION  
SUCH AS COMPLETE CUT-OFF, FOCUSING, AND EXTREME  
LATERAL SPREAD ARE DISCUSSED. THE EFFECT OF AIR  
TURBULENCE NEAR THE GROUND IS CONSIDERED. A NUMBER  
OF COMPARISONS WITH TEST DATA MEASURED AT OKLAHOMA  
CITY (1964) ARE PRESENTED, AND RECOMMENDATIONS  
FOR ADDITIONAL EXPERIMENTAL AND THEORETICAL WORK ARE  
OUTLINED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZUM09

AD- 610 822

ANDREWS ASSOCIATES INC OKLAHOMA CITY OKLA

STRUCTURAL RESPONSE TO SONIC BOOMS.

(U)

DESCRIPTIVE NOTE: FINAL REPT., VOL. 1.

FEB 65 240P

CONTRACT: FA64AC6 526

MONITOR: FAA-SST 65-1-VOL-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH  
MUGGINS, THOMPSON, BALL AND ASSOCIATES, INC.,  
OKLAHOMA CITY, OKLA.

DESCRIPTORS: (\*SONIC BOOM, DAMAGE),  
(\*HOUSING(DWELLINGS), SONIC BOOM), BUILDINGS, STRUCTURAL  
MEMBERS, STRESSES, DEGRADATION, FRACTURE (MECHANICS),  
SHOCK WAVES, STRAIN (MECHANICS), AIRCRAFT, FINISHES AND  
FINISHING, URBAN AREAS, OKLAHOMA, FLIGHT PATHS,  
PRESSURE, TESTS (U)

THE REPORT DOCUMENTS AND REPORTS ON THE RESULTS OF  
THE STRUCTURAL RESPONSE OF SOME RESIDENTIAL  
STRUCTURES IN THE OKLAHOMA CITY AREA DURING A 39-  
WEEK TESTING PROGRAM CONSISTING OF TWENTY-SIX WEEKS  
OF EIGHT DAILY, CONTROLLED SONIC BOOMS, FOLLOWED BY  
THIRTEEN WEEKS OF OBSERVATION AND INSPECTION OF THE  
STRUCTURES TO DETERMINE THE RATE OF NORMAL  
DETERIORATION AS COMPARED TO THE RATE OF  
DETERIORATION FOUND DURING THE 26-WEEK SONIC BOOM  
PERIOD. THE TEST STRUCTURES CONSISTED OF A TOTAL  
OF ELEVEN TYPICAL TYPES OF RESIDENTIAL STRUCTURES,  
EIGHT OF WHICH WERE LOCATED WITHIN FIVE MILES OF THE  
REGULAR FLIGHT PATH, ONE OF WHICH WAS LOCATED TEN  
MILES FROM THE FLIGHT PATH, AND THE REMAINING TWO  
LOCATED ABOUT TWENTY-FIVE MILES FROM THE FLIGHT PATH  
AT NORMAN, OKLAHOMA WHICH WAS BEYOND THE SONIC  
BOOM AREA. CONCLUSIVE EVIDENCE OF SIGNIFICANT  
DAMAGE TO THE TEST STRUCTURES WAS NOT PRODUCED BY  
THIS INVESTIGATION. HOWEVER, A SIGNIFICANT  
INCREASE IN OCCURRENCE OF MINOR PAINT CRACKING OVER  
NAIL HEADS AND IN CORNERS OF THE WALLBOARD INTERIORS  
OF TWO OF THE TEST STRUCTURES DURING THE SONIC BOOM  
PERIOD SUGGESTS THAT SONIC BOOMS ACCELERATED THIS  
RATHER MINOR DETERIORATION. NO INCREASE OCCURRED IN  
THE RATE AT WHICH PAINT FINISH ON LATH AND PLASTER  
WALL INTERIORS CRACKED DURING THE SONIC BOOM PERIOD.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 610 823

ANDREWS ASSOCIATES INC OKLAHOMA CITY OKLA

STRUCTURAL RESPONSE TO SONIC BOOMS.

(U)

DESCRIPTIVE NOTE: FINAL REPT., VOL. 2, APP.

FEB 65 181P

CONTRACT: FA64AC6 526

MONITOR: FAA-SST 65-1-VOL-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH  
HUGGINS, THOMPSON, BALL AND ASSOCIATES, INC.,  
OKLAHOMA CITY, OKLA.

DESCRIPTORS: (\*SONIC BOOM, DAMAGE),  
(\*HOUSING(DWELLINGS), SONIC BOOM), BUILDINGS, STRUCTURAL  
MEMBERS, STRESSES, DEGRADATION, FRACTURE (MECHANICS),  
SHOCK WAVES, STRAIN (MECHANICS), SUPERSONIC AIRCRAFT,  
EXPERIMENTAL DATA, MECHANICAL DRAWINGS, URBAN AREAS,  
OKLAHOMA, FLIGHT PATHS, PRESSURE (U)

THE VOLUME CONSISTS OF APPENDICES TO AD-610 822.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 613 620

NATIONAL OPINION RESEARCH CENTER NEW YORK

COMMUNITY REACTIONS TO SONIC BOOMS IN THE OKLAHOMA CITY AREA.

(U)

DESCRIPTIVE NOTE: FINAL REPT. FOR APR 63-FEB 65,

FEB 65 61P BORSKY, PAUL N. ;

REPT. NO. 101

CONTRACT: AF33 657 11148

PROJ: 7231

TASK: 723103

MONITOR: AMRL , TR-65-37

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*SONIC BOOM, OKLAHOMA), (\*REACTION (PSYCHOLOGY), SONIC BOOM), (\*AIR TRANSPORTATION, OKLAHOMA), SUPERSONIC AIRCRAFT, TRANSPORT AIRCRAFT, PUBLIC OPINION, ACOUSTICS

(U)

THE OKLAHOMA CITY, OKLAHOMA, AREA WAS REPEATEDLY EXPOSED TO SONIC BOOMS GENERATED BY A SIMULATED SCHEDULE OF SUPERSONIC TRANSPORT OVERFLIGHTS DURING A PERIOD OF 6 MONTHS FROM FEBRUARY TO JULY 1964. THE SCHEDULE PROVIDED FOR EIGHT SONIC BOOMS PER DAY PROGRAMED AT AN INTENSITY OF 1.5 POUNDS PER SQUARE FOOT (PSF) DURING THE FIRST PORTION OF THE STUDY AND 2.0 PSF DURING THE LATTER STAGES. ALMOST 3000 LOCAL RESIDENTS WERE PERSONALLY INTERVIEWED THREE TIMES DURING THE 6-MONTH PERIOD TO DETERMINE THE NATURE AND EXTENT OF THEIR REACTIONS TO THE SONIC BOOMS. AMONG THE FINDINGS IT WAS SHOWN THAT SUBSTANTIAL NUMBERS OF RESIDENTS REPORTED INTERRUPTIONS OF ORDINARY LIVING ACTIVITIES, AND SOME ANNOYANCE WITH THESE INTERRUPTIONS, HOWEVER, THE OVERWHELMING MAJORITY FELT THEY COULD LEARN TO LIVE WITH THE NUMBERS AND KINDS OF BOOMS EXPERIENCED DURING THE 6-MONTH STUDY.

(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 618 770

AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB  
OHIO

HUMAN RESPONSES TO SONIC BOOM,

(U)

MAY 65 IIP NIXON, CHARLES W. ;  
REPT. NO. AMRL-TR-65-9  
PROJ: 7231  
TASK: 723103

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PUB. IN AEROSPACE MEDICINE V36 N5  
P399-405 MAY 1965 (COPIES NOT AVAILABLE TO DDC OR  
CLEARINGHOUSE CUSTOMERS).

DESCRIPTORS: (\*SONIC BOOM, REACTION(PSYCHOLOGY)), JET  
PLANE NOISE, SHOCK WAVES, SUPERSONIC CHARACTERISTICS,  
TOLERANCES(PHYSIOLOGY), THRESHOLDS(PHYSIOLOGY), HUMANS,  
BEHAVIOR, ATTITUDES(PSYCHOLOGY) (U)

AIRCRAFT IN SUPERSONIC FLIGHT GENERATE PRESSURE  
WAVES THAT ARE PERCEIVED ALONG THE GROUND AS SONIC  
BOOMS. THE IMPACT OF THE SONIC BOOM PHENOMENON  
UPON HUMANS HAS GENERATED A GREAT DEAL OF CONCERN AND  
CONJECTURE REGARDING INDIVIDUAL RESPONSES AND  
PERCEPTIONS, GROUP RESPONSES, AND PHYSIOLOGICAL  
RESPONSES. DATA ACCUMULATED DURING THE PAST  
SEVERAL YEARS BY SPECIFIC GOVERNMENTAL AND AVIATION  
AGENCIES HAVE PROVIDED SOME INSIGHT INTO THE MANNER  
IN WHICH INDIVIDUALS AND COMMUNITIES HAVE RESPONDED  
TO THE SONIC BOOM. THE REPORT SUMMARIZES THESE  
DATA IN TERMS OF THE NATURE OF HUMAN RESPONSES AND  
THE MANNER IN WHICH THEY OCCUR, FACTORS INFLUENCING  
ACCEPTANCE OF THE BOOM, THE POSSIBILITY OF  
PHYSIOLOGICAL INJURY, PSYCHOLOGICAL EFFECTS, AND SOME  
REPORTS OF ALLEGED MINOR DAMAGE TO PROPERTY AND THEIR  
RELATION TO HUMAN REACTIONS. (AUTHOR) (U)



UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 619 720

REGIONAL ENVIRONMENTAL HEALTH LAB (AFLC) KELLY AFB TEX

EFFECT OF SONIC BOOMS ON THE HATCHABILITY OF CHICKEN EGGS. (U)

FEB 65 40P HEINEMANN, JACK H. ;LEBROCK,  
ERIC F. ,JR.;  
PROJ: 62-2  
MONITOR: FAA-SST 65-12

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: LIMITED NUMBER OF COPIES CONTAINING COLOR OTHER THAN BLACK AND WHITE ARE AVAILABLE UNTIL STOCK IS EXHAUSTED. REPRODUCTIONS WILL BE MADE IN BLACK AND WHITE ONLY.

DESCRIPTORS: (+SONIC BOOM, DAMAGE), (+EGGS, SONIC BOOM), CHICKENS, EXPOSURE(PHYSIOLOGY), EMBRYOS, STRESS(PHYSIOLOGY), SUPERSONIC AIRCRAFT, VETERINARY MEDICINE (U)

STRAIN-CROSS WHITE LEGHORN HATCHING EGGS WERE INCUBATED IN AN AREA SUBJECTED TO 30 OR MORE SONIC BOOMS PER DAY THROUGHOUT THE 21 DAYS REQUIRED TO HATCH CHICKEN EGGS. THE OVERPRESSURES OF THESE SONIC BOOMS, CREATED BY USAF SUPERSONIC F-104 AIRCRAFT, WERE EQUAL TO OR MUCH GREATER THAN THOSE NORMALLY PRODUCED BY OPERATIONAL MILITARY AIRCRAFT OR THE PROPOSED CIVILIAN SUPERSONIC TRANSPORT (SST). THE HATCHABILITY OF THE EGGS EXPOSED TO THE SONIC BOOMS WAS NOT LOWER THAN THAT OF UNEXPOSED EGGS OR TO PREVIOUS HATCHES OF THIS STRAIN IN A COMMERCIAL HATCHERY. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 620 347

TENNESSEE UNIV KNOXVILLE

AN ANALYSIS OF LIABILITY IN AIRCRAFT TRESPASS AND  
NUISANCE CASES SINCE 1958. (U)

DESCRIPTIVE NOTE: MASTER'S THESIS,

AUG 65 85P ROBINS, RAYMOND C. ;

CONTRACT: AF33 608 1118

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED TO THE GRADUATE COUNCIL  
OF THE UNIVERSITY OF TENNESSEE.

DESCRIPTORS: (\*JET PLANE NOISE, LAW); (\*LAW, JET PLANE  
NOISE), SONIC BOOM, AIRPORTS, MILITARY FACILITIES,  
UNITED STATES GOVERNMENT, AIRCRAFT NOISE, LOW ALTITUDE,  
FLIGHT, MILITARY LAW (U)

THE STUDY DISCUSSES THE NATURE OF THE AIRCRAFT  
NOISE PROBLEM, ANALYZES COURT CASES INVOLVING JET  
NOISE AROUND AIRPORTS AND MILITARY BASES, AND  
IDENTIFIES THE FACTORS SIGNIFICANT IN DETERMINING  
WHETHER NOISE CONSTITUTES A COMPENSABLE DAMAGE. IN  
THE 1946 'UNITED STATES V. CAUSBY' CASE, THE  
U. S. WAS HELD LIABLE FOR THE NOISE OF ARMY  
PLANES THAT INTERFERED SERIOUSLY WITH THE OPERATION  
OF CAUSBY'S CHICKEN FARM. IN THE 1962 'GRIGGS  
V. ALLEGHENY COUNTY' CASE, THE SUPREME COURT  
HELD THE MUNICIPALITY OPERATING THE GREATER  
PITTSBURG AIRPORT LIABLE FOR AIRCRAFT NOISE,  
SAYING THE COUNTY SHOULD HAVE CONDEMNED ENOUGH  
PROPERTY TO PREVENT AIRCRAFT OPERATIONS FROM  
INTERFERING WITH ADJACENT LANDOWNERS. THE  
CONTENTION IS MADE THAT (1) HIGHER COURTS SHOULD  
INSIST ON MORE CONSISTENT INTERPRETATION OF THE  
CRITERIA USED TO DETERMINE WHEN AN EASEMENT HAS BEEN  
TAKEN, ALTITUDE ALONE BEING A LESS IMPORTANT FACTOR  
THAN OTHERS, (2) INTENSITY AND FREQUENCY OF NOISE  
AND THE USE MADE OF THE PROPERTY IS MORE IMPORTANT  
THAN A LINE MARKING THE PROPERTY BOUNDARY, (3)  
RIGID REQUIREMENTS SHOULD BE SET TO INSURE ADEQUATE  
SPACE FOR NEW AIRPORTS, (4) SOLVING THE NOISE  
PROBLEM AT EXISTING AIRPORTS SHOULD BE A COOPERATIVE  
EFFORT, AND (5) DETERMINATION OF COMPENSABLE  
NOISE DAMAGE SHOULD BE MADE BY COURTS WITH  
CONSIDERATION MORE FOR DEGREE OF DISTURBANCE THAN FOR  
PROPERTY BOUNDARIES. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 624 050 1/2 20/1  
SUPERSONIC TRANSPORT DEVELOPMENT FEDERAL AVIATION AGENCY  
WASHINGTON D C

SONIC BOOM RESEARCH AND DESIGN CONSIDERATIONS IN THE  
DEVELOPMENT OF A COMMERCIAL SUPERSONIC TRANSPORT  
(SST), (U)

NOV 65 32P HIGGINS, THOMAS H. I  
REPT. NO. FAA-SST-65-19

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE MEETING OF THE  
ACOUSTICAL SOCIETY OF AMERICA (70TH), ST. LOUIS,  
MO.

DESCRIPTORS: (\*SONIC BOOM, COMMERCIAL PLANES),  
(\*SUPERSONIC AIRCRAFT, TRANSPORT AIRCRAFT), (\*TRANSPORT,  
SUPERSONIC AIRCRAFT), (\*COMMERCIAL PLANES, SONIC BOOM),  
AIRCRAFT NOISE, TOLERANCES(PHYSIOLOGY),  
REACTION(PSYCHOLOGY), PUBLIC OPINION, STRUCTURES,  
DAMAGE, SCIENTIFIC RESEARCH, OKLAHOMA, NEW MEXICO,  
ACOUSTICS: AERONAUTICS (U)

THIS PAPER PRESENTS A SHORT HISTORY OF SONIC BOOM  
RESEARCH AND RELATED OPERATIONAL CONSIDERATIONS IN  
THE DEVELOPMENT OF A COMMERCIAL SUPERSONIC TRANSPORT  
(SST). THE MOST INTENSIVE PUBLIC REACTION RESEARCH  
PROGRAM TO DATE WAS CONDUCTED AT OKLAHOMA CITY,  
OKLAHOMA. AN INTENSIVE RESEARCH PROGRAM TO  
DETERMINE STRUCTURAL REACTION TO SONIC BOOMS WAS  
CONDUCTED AT THE WHITE SANDS MISSILE RANGE.  
THESE TWO PROGRAMS ARE DISCUSSED AND A BRIEF  
SUMMARY OF THE FINDINGS OF THE PROGRAMS IS PRESENTED.  
THE PAPER CONCLUDES THAT ALTHOUGH MUCH HAS BEEN  
LEARNED ABOUT THE SONIC BOOM PHENOMENA THROUGH PAST  
FLIGHT AND RESEARCH ACTIVITIES, ADDITIONAL RESEARCH  
AND THEORETICAL STUDIES ARE WARRANTED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 625 332 1/3 20/1 5/10 13/13  
NATIONAL OPINION RESEARCH CENTER NEW YORK

COMMUNITY REACTIONS TO SONIC BOOMS IN THE OKLAHOMA  
CITY AREA. VOLUME II. DATA ON COMMUNITY REACTIONS  
AND INTERPRETATIONS. (U)

DESCRIPTIVE NOTE: FINAL REPT., APR 63-FEB 65,  
OCT 65 315P BORSKY, PAUL N. ;  
REPT. NO. 101-PT-2  
CONTRACT: AF33(657)-11148  
PROJ: 7231  
TASK: 723103  
MONITOR: AMRL , TR-65-37-VOL-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*SONIC BOOM, PUBLIC OPINION),  
ATTITUDES(PSYCHOLOGY), POPULATION, URBAN AREAS, DAMAGE,  
STRUCTURES, REACTION(PSYCHOLOGY), NOISE, SUPERSONIC  
AIRCRAFT, COMMERCIAL PLANES, OKLAHOMA, TABLES(DATA) (U)

DURING A PERIOD OF SIX MONTHS FROM FEBRUARY TO  
JULY 1964, THE OKLAHOMA CITY, OKLAHOMA, AREA  
WAS REPEATEDLY EXPOSED TO SONIC BOOMS GENERATED TO  
SIMULATE OVERPRESSURE LEVELS THAT ARE EXPECTED FOR  
SUPERSONIC TRANSPORT OVERFLIGHTS. THE SCHEDULE  
PROVIDED FOR EIGHT SONIC BOOMS PER DAY. DURING THE  
SIX-MONTH PERIOD, ALMOST 3,000 LOCAL RESIDENTS WERE  
INTERVIEWED THREE TIMES TO DETERMINE THE NATURE AND  
EXTENT OF THEIR REACTIONS TO THE SONIC BOOMS. THIS  
REPORT CONTAINS A DETAILED DESCRIPTION OF THE OVERALL  
STUDY DESIGN INCLUDING THE SELECTION OF HOUSEHOLDS,  
SELECTION OF RESPONDENTS, TRAINING AND SELECTION OF  
INTERVIEWERS AND SAMPLES OF QUESTIONNAIRES USED  
DURING THE INTERVIEWS. AMONG THE FINDINGS IT WAS  
DETERMINED THAT ORDINARY LIVING ACTIVITIES WERE OFTEN  
INTERRUPTED BY SONIC BOOMS, BUT THAT A MAJORITY OF  
THE RESIDENTS FELT THEY COULD LEARN TO LIVE WITH THE  
INTERRUPTIONS. A SUBSTANTIAL NUMBER OF RESIDENTS  
FELT THEY HAD SUSTAINED DAMAGES FROM THE BOOMS,  
ALTHOUGH DETAILED ENGINEERING OBSERVATIONS OF  
STRUCTURES IN THE AREA DID NOT CONFIRM MOST OF THESE  
REPORTS. AS THE INTENSITY OF THE BOOMS INCREASED,  
ACCEPTANCE OF THE BOOMS BY RESIDENTS WAS REDUCED.  
RESIDENTS WHO FELT THAT THE DEVELOPMENT OF A  
COMMERCIAL SUPERSONIC AIRPLANE WAS IMPORTANT WERE  
MORE LIKELY TO ACCEPT THE EXPOSURES TO THE SONIC  
BOOMS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 628 175 6/10  
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB  
OHIO

ON NOISE AND VIBRATION EXPOSURE CRITERIA, (U)

APR 65 17P VON GIERKE, HENNING E. ;  
REPT. NO. AMRL-TR-65-84,  
PROJ: AF-7231,  
TASK: 723101.

UNCLASSIFIED REPORT  
AVAILABILITY: PUBLISHED IN ARCHIVES OF  
ENVIRONMENTAL HEALTH VII P327-39 SEP 1965. COPIES  
TO DDC USERS ONLY.  
SUPPLEMENTARY NOTE:

DESCRIPTORS: (\*NOISE, TOLERANCES(PHYSIOLOGY)),  
(\*VIBRATION, TOLERANCES(PHYSIOLOGY)), SONIC BOOM,  
PERFORMANCE(HUMAN), INDUSTRIAL MEDICINE, STANDARDS,  
SUPERSONIC AIRCRAFT, STRESS(PHYSIOLOGY) (U)

REPRINT: ON NOISE AND VIBRATION EXPOSURE CRITERIA.

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 637 563 1/3 20/1 5/10  
NATIONAL OPINION RESEARCH CENTER NEW YORK

COMMUNITY REACTIONS TO SONIC BOOMS IN THE OKLAHOMA  
CITY AREA. VOLUME III. QUESTIONNAIRES. APPENDIX TO  
VOLUME II. (U)

DESCRIPTIVE NOTE: FINAL REPT. APR 63-FEB 65.

MAR 66 60P BORSKY, PAUL N. I

CONTRACT: AF 33(657)-11148,

PROJ: AF-7231,

TASK: 723103,

MONITOR: AMRL TR-65-37-VOL-3

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-625 332.

DESCRIPTORS: (\*SONIC BOOM, PUBLIC OPINION),  
REACTION(PSYCHOLOGY), NOISE, SOUND, PRESSURE, SUPERSONIC  
AIRCRAFT, OKLAHOMA (U)

THE APPENDIX CONTAINS SAMPLES OF QUESTIONNAIRES  
USED DURING THE INTERVIEWS THAT TOOK PLACE FROM  
FEBRUARY TO JULY 1964 IN THE OKLAHOMA CITY,  
OKLAHOMA, AREA. THAT AREA WAS REPEATEDLY EXPOSED  
TO SONIC BOOMS GENERATED TO SIMULATE OVERPRESSURE  
LEVELS THAT ARE EXPECTED FOR SUPERSONIC TRANSPORT  
OVERFLIGHTS. THE SCHEDULE PROVIDED FOR EIGHT SONIC  
BOOMS PER DAY. DURING THE 6-MONTH PERIOD, ALMOST  
3,000 LOCAL RESIDENTS WERE INTERVIEWED THREE TIMES TO  
DETERMINE THE NATURE AND EXTENT OF THEIR REACTIONS TO  
THE SONIC BOOMS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 641 352 6/19 5/10 20/1  
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB  
OHIO

EFFECTS OF SONIC BOOM ON PEOPLE: REVIEW AND OUTLOOK.

(U)

NOV 65 12P VON GIERKE, HENNING E. ;  
REPT. NO. AMRL-TR-65-195  
PROJ: AF-7231  
TASK: 723103

UNCLASSIFIED REPORT

AVAILABILITY: PUBLISHED IN JOURNAL OF ACOUSTICAL  
SOCIETY OF AMERICA V39 N5 PT2 P543-50 MAY 1966.

DESCRIPTORS: (\*SONIC BOOM, TOLERANCES(PHYSIOLOGY)),  
(\*PSYCHOACOUSTICS, SONIC BOOM), STRESS(PHYSIOLOGY),  
STRESS(PSYCHOLOGY), PRESSURE, NOISE,  
THRESHOLDS(PHYSIOLOGY), VIBRATION, SOCIAL PSYCHOLOGY,  
REVIEWS, SYMPOSIA

(U)

THE REPORT REVIEWS THE HISTORY OF OBSERVATIONS ON  
HUMAN REACTIONS TO THE SONIC BOOM FROM THE TIME WHEN  
THE BOOM WAS A DEMONSTRATION CURIOSITY TO THE PRESENT  
DAY WHERE REACTION OF THE POPULATION TO THE SONIC  
BOOM IS A SCIENTIFIC PROBLEM OF TECHNICAL, ECONOMIC,  
SOCIAL, AND POLITICAL CONSEQUENCES AT THE NATIONAL  
AND INTERNATIONAL LEVEL. THE FIELD PROGRAMS  
CONDUCTED BY THE USAF AND NASA OVER THE LAST 15  
YEARS AND OVER THE LAST 5 YEARS BY THE FAA WERE ALL  
OF LIMITED SCOPE WITH RESPECT TO EXPLORING DIRECT AND  
INDIRECT PHYSIOLOGICAL AND PSYCHOLOGICAL HUMAN  
REACTIONS TO SONIC BOOMS OF DIFFERENT INTENSITY AND  
EXPOSURE FREQUENCY. ALTHOUGH THE DATA ACCUMULATED  
MIGHT BE ADEQUATE TO DECIDE ON PRELIMINARY STOPGAP  
EXPOSURE CRITERIA, IT IS OBVIOUS THAT A BROADER  
APPROACH TO THE PROBLEM IS REQUIRED. LABORATORY  
WORK IN SUPPORT OF THESE QUESTIONS HAS HARDLY BEEN  
STARTED. NEITHER CONVENTIONAL ACOUSTIC AND  
VIBRATION GENERATORS FOR BOOM-TYPE STIMULATION NOR  
SPECIAL EQUIPMENT FOR HIGH-FIDELITY SONIC-BOOM  
SIMULATION HAVE BEEN FULLY UTILIZED. SOME OF THE  
OPEN QUESTIONS AND POSSIBLE APPROACHES ARE DISCUSSED  
AS PART OF A BROAD, LONG-RANGE RESEARCH PROGRAM  
REQUIRED TO COME UP WITH SCIENTIFIC DATA AS BASES FOR  
OPERATIONAL SONIC-BOOM EXPOSURE CRITERIA.

(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 646 028 1/3 20/1  
BOEING CO RENTON WASH AIRPLANE DIV

EFFECT OF SONIC BOOM ON SUPERSONIC TRANSPORT DESIGN  
AND PERFORMANCE, (U)

FEB 64 17P KANE, EDWARD J. ISIGALLA,  
ARMAND I  
REPT. NO. D6-8614

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: CONFERENCE ON APPLIED METEOROLOGY  
OF THE AMERICAN METEOROLOGICAL SOCIETY; ATMOSPHERIC  
PROBLEMS OF AEROSPACE VEHICLES (5TH), MARCH 2-6,  
1964, ATLANTIC CITY, NEW JERSEY.

DESCRIPTORS: (\*SUPERSONIC AIRCRAFT, DESIGN), (\*TRANSPORT  
AIRCRAFT, DESIGN), (\*SONIC BOOM, CONTROL),  
CONFIGURATION, PERFORMANCE(ENGINEERING), PRESSURE, LIFT,  
ATMOSPHERES, FLIGHT PATHS (U)

THE PAPER DISCUSSES THE EFFECT OF SONIC BOOM  
OVERPRESSURE LIMITS ON THE DESIGN AND PERFORMANCE OF  
A SUPERSONIC TRANSPORT. POSSIBLE METHODS OF  
REDUCING THE SONIC BOOM BY CONFIGURATION TAILORING  
AND THE EFFECT OF THIS ON PERFORMANCE ARE DESCRIBED.  
THE SONIC BOOM OVERPRESSURE PRODUCED BY AN AIRPLANE  
IS INFLUENCED BY CONTRIBUTIONS OF THE VOLUME AND LIFT  
OF THE CONFIGURATION, THE STRUCTURE OF THE  
ATMOSPHERE, AND THE FLIGHT PATH OF THE AIRPLANE.  
ESTABLISHMENT OF MAXIMUM OVERPRESSURE LEVELS MAY  
IMPOSE SERIOUS DESIGN AND OPERATION RESTRICTIONS ON  
THE AIRPLANE, RESULTING IN A COMPROMISED  
CONFIGURATION WHICH DOES NOT OPERATE EFFICIENTLY.  
IT IS POSSIBLE TO CONTROL THE SHOCK WAVE STRENGTH  
BY CAREFUL DESIGN OF THE CONFIGURATION SO AS TO  
EMPLOY FAVORABLE INTERACTIONS BETWEEN THE LIFT AND  
VOLUME CONTRIBUTIONS. HOWEVER, CARE MUST BE TAKEN  
NOT TO COMPROMISE OTHER DESIGN FEATURES OF THE  
AIRPLANE, SUCH AS ITS DRAG, IN ORDER TO OBTAIN LOWER  
SONIC BOOM OVERPRESSURES. (AUTHOR) (U)



UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 646 676 1/3 20/1 1/2  
DEPUTY CHIEF OF STAFF RESEARCH AND DEVELOPMENT (AIR FORCE)  
WASHINGTON D C

THE SONIC BOOM PROBLEM.

(U)

DESCRIPTIVE NOTE: DEVELOPMENT PLANNING MEMO.  
MAR 63 32P

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, STATE-OF-THE-ART REVIEWS),  
(\*SUPERSONIC AIRCRAFT, DESIGN), (\*TRANSPORT AIRCRAFT,  
DESIGN), (\*CIVIL AVIATION, SONIC BOOM), FLIGHT TESTING,  
LIFT, PUBLIC OPINION, PROPAGATION, SUPERSONIC FLIGHT (U)

THE MEMO SUMMARIZES THE CURRENT STATE OF KNOWLEDGE  
RELATING TO SONIC BOOM GENERATION, PROPAGATION, AND  
EFFECTS, AND ATTEMPTS TO JUDGE THE SEVERITY OF THE  
PROBLEM THAT WILL ARISE WITH THE BEGINNING OF  
COMMERCIAL SUPERSONIC FLIGHTS. IT IS BASED ON BOTH  
RECENTLY PUBLISHED INFORMATION AND CONVERSATIONS WITH  
SPECIALISTS THROUGHOUT THE COUNTRY WHO ARE WORKING IN  
THE SONIC BOOM FIELD. THE LATTER INCLUDE  
REPRESENTATIVES OF PRIVATE INDUSTRY AS WELL AS OF  
GOVERNMENT AGENCIES. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 647 326 20/1  
AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB  
OHIO

EFFECTS OF SONIC BOOM ON PEOPLE: ST. LOUIS,  
MISSOURI, 1961-1962. (U)

NOV 65 12P NIXON, CHARLES W. IBORSKY,  
PAUL N. I  
REPT. NO. AMRL-TR-65-196  
PROJ: AF-7231  
TASK: 723102

UNCLASSIFIED REPORT

AVAILABILITY: PUBLISHED IN JOURNAL OF THE  
ACOUSTICAL SOCIETY OF AMERICA V39 N5 PT2 PSS1-8  
MAY 1966. PREPARED IN COOPERATION WITH CHICAGO  
UNIV., ILL. NATIONAL OPINION RESEARCH CENTER.  
SUPPLEMENTARY NOTE: RESEARCH SUPPORTED IN PART BY NASA  
CONTRACT NAS1-1397.

DESCRIPTORS: (\*SONIC BOOM, MEDICAL RESEARCH), (\*PUBLIC  
OPINION, SONIC BOOM), HUMANS, NOISE, SUPERSONIC FLIGHT,  
SUPERSONIC AIRCRAFT, ACOUSTICS, DAMAGE, SOUND  
TRANSMISSION (U)

THE VICINITY OF ST. LOUIS, MISSOURI, WAS  
EXPOSED TO APPROXIMATELY 150 SONIC BOOMS DURING A 10-  
MONTH PERIOD FROM JULY 1961 TO APRIL 1962.  
GROUND OVERPRESSURES, RANGING UP TO ABOUT 3 LB/SQ  
FT, WERE CAREFULLY MEASURED FOR A SERIES OF 17 OF THE  
SUPERSONIC FLIGHTS. DATA OBTAINED FROM OVER 2300  
DIRECT INTERVIEWS, ANALYSES OF COMPLAINTS, AND  
ENGINEERING EVALUATIONS OF ALLEGED DAMAGE WERE  
RELATED TO INFORMATION ON AIRCRAFT OPERATIONS AND  
SONIC-BOOM OVERPRESSURE MEASUREMENTS. MOST  
RESIDENTS INTERVIEWED INDICATED SOME INTERFERENCE  
WITH ROUTINE LIVING ACTIVITIES, YET LESS THAN 1%  
FILED FORMAL COMPLAINTS. ALLEGED BUILDING DAMAGE  
WAS SUPERFICIAL IN NATURE AND CONSISTED MOSTLY OF  
CRACKS IN BRITTLE SURFACES. THERE WERE NO REPORTS  
OF DIRECT ADVERSE PHYSIOLOGICAL EFFECTS. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 647 513      20/1      14/2      1/2      19/1  
EXPLOSIVES RESEARCH AND DEVELOPMENT ESTABLISHMENT WALTHAM  
ABBAY (ENGLAND)

SONIC BANG SIMULATION BY A NEW EXPLOSIVES TECHNIQUE. (U)

DEC 66      7P      HAWKINS, S. J. THICKS, J.  
A. I  
REPT. NO. ERDE-OFFPRINT-66/13

UNCLASSIFIED REPORT  
AVAILABILITY: PUBLISHED IN NATURE V211 NB055  
P1244-5 SEP 17 1966.

DESCRIPTORS: (\*SONIC BOOM, SIMULATION), (\*EXPLOSIVE  
CHARGES, GEOMETRIC FORMS), SUPERSONIC FLIGHT, SHOCK  
WAVES, ACOUSTICS, MECHANICAL WAVES, GREAT BRITAIN (U)

A STUDY OF THE FEASIBILITY OF USING EXPLOSIVES TO  
SIMULATE THE PRESSURE WAVEFORMS GENERATED AT GROUND  
LEVEL BY SUPERSONIC OVERFLIGHTS LED TO THE  
REALIZATION THAT IT IS POSSIBLE TO SIMULATE WAVEFORMS  
OF A WIDE RANGE OF SHAPES AND DURATIONS USING  
EXTENDED EXPLOSIVE CHARGES HAVING A HIGH LENGTH/  
BREADTH RATIO. THE REPORT DESCRIBES PRELIMINARY  
RESULTS OBTAINED FROM USING THESE CHARGES IN SONIC  
BOOM SIMULATION STUDIES, AND INDICATES A NUMBER OF  
OTHER APPLICATIONS IN WHICH SUCH TECHNIQUES SHOW  
PROMISE. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 648 264 20/14 20/1 17/9  
BOLT BERANEK AND NEWMAN INC CAMBRIDGE MASS

PRELIMINARY EXPERIMENTAL STUDY OF EMAC PROBE USING  
ACOUSTIC SHOCK WAVES AS REFLECTING SURFACES. (U)

DESCRIPTIVE NOTE: FINAL REPT., NOV 63-JAN 65,  
NOV 65 66P ALLEN, CLAYTON H. WEINER,  
STEVEN D. I  
REPT. NO: 3BN-1228  
CONTRACT: AF 19(628)-4013  
PROJ: AF-6672  
TASK: 667205

UNCLASSIFIED REPORT

DESCRIPTORS: (•ELECTROMAGNETIC RADIATION, •ACOUSTICS),  
DOPPLER RADAR, METEOROLOGICAL RADAR, COHERENT RADAR,  
SONIC BOOM, RADAR CLUTTER, SIGNALS, SHOCK WAVES,  
FEASIBILITY STUDIES, RADAR REFLECTIONS (U)

PRELIMINARY EXPERIMENTS HAVE BEEN MADE IN AN  
ATTEMPT TO DEMONSTRATE THE FEASIBILITY OF REFLECTING  
RADAR FROM AN ACOUSTIC SHOCK WAVE. TESTS WERE  
CONDUCTED USING UHF RADAR (71.5 CM WAVELENGTH)  
TO VIEW SONIC BOOM SHOCK WAVES. HOWEVER, GROUND  
CLUTTER RAISED THE EFFECTIVE NOISE LEVEL AND  
ATMOSPHERIC TURBULENCE MAY HAVE ROUGHENED THE SHOCK  
FRONT ENOUGH TO DECREASE THE RETURNED SIGNAL LEVEL  
SIGNIFICANTLY; AS A RESULT, NO INDICATION OF A RETURN  
IDENTIFIABLE WITH THE SONIC BOOM SHOCK FRONT WAS  
OBSERVED. IT IS CONCLUDED THAT THE USE OF  
DOPPLER TECHNIQUES TO ELIMINATE CLUTTER AND THE USE  
OF COHERENT INTEGRATION TO INCREASE THE EFFECTIVE  
SIGNAL LEVEL ARE NECESSARY FOR THE SUCCESS OF THIS  
EMAC PROBE TECHNIQUE. BRIEF THEORETICAL AND  
EXPERIMENTAL STUDIES OF SHOCK WAVE SOURCES WERE  
CONDUCTED. PROPOSALS ARE PRESENTED FOR FURTHER  
DEFINITIVE EXPERIMENTS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 651 857 14/2 20/1  
ROYAL AIRCRAFT ESTABLISHMENT FARNBOROUGH (ENGLAND)

PROPOSAL FOR A SHOCK-TUBE FACILITY TO SIMULATE SONIC  
BANGS. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
NOV 66 19P WARREN, C. H. E. 1  
REPT. NO. TR-66344

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SHOCK TUBES, SONIC BOOM), (\*SONIC BOOM,  
SIMULATION), SUPERSONIC FLIGHT, DESIGN, AIRCRAFT, SOUND  
TRANSMISSION, GREAT BRITAIN (U)

THE REPORT PROPOSES THE USE OF A SHOCK-TUBE  
FACILITY TO SIMULATE SONIC BANGS FOR THE STUDY OF  
THEIR EFFECTS. THE BASIC PHILOSOPHY OF SUCH A  
FACILITY IS PROPOUNDED FROM THEORETICAL  
CONSIDERATIONS, SUBSTANTIATED BY SOME PILOT  
EXPERIMENTAL STUDIES. IT IS SUGGESTED THAT A  
DETAILED DESIGN OF A FACILITY BASED ON THE PROPOSALS  
SHOULD NOW BE MADE. THIS WILL REQUIRE THE SOLUTION  
OF A NUMBER OF TECHNICAL PROBLEMS, WHICH ARE LISTED.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 651 899 20/1 4/2 4/1  
BUREAU OF NAVAL WEAPONS WASHINGTON D C WEAPON SYSTEMS  
ANALYSIS DIV

WEATHER ASPECTS OF THE SONIC BOOM, (U)

MAY 60 61P FISHER, DAVID ;  
REPT. NO. RRSY-60-24

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, METEOROLOGICAL PHENOMENA),  
(\*SOUND TRANSMISSION, METEOROLOGICAL PHENOMENA), MACH  
NUMBER, JET STREAMS, SHOCK WAVES, AIRCRAFT NOISE, WIND,  
ATMOSPHERIC TEMPERATURE, ATMOSPHERE MODELS (U)

AN EXPLANATION OF THE EFFECT OF METEOROLOGICAL  
CONDITIONS ON THE PATH OF THE SONIC BOOM IS  
PRESENTED. AREAS COVERED BY SONIC BOOMS RESULTING  
FROM AIRCRAFT FLYING AT VARIOUS MACH NUMBERS AND  
DIVE ANGLES ARE SHOWN, TAKING STANDARD ATMOSPHERIC  
GRADIENTS INTO ACCOUNT. CALCULATIONS ARE GIVEN FOR  
THE EFFECT OF THE JET STREAM AS WELL AS ORDINARY  
WINDS ON THE SONIC BOOM. (AUTHOR) (U)

UNCLASSIFIED

/ZOM09

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMU9

AD- 651 907 6/19  
CIVIL AEROMEDICAL INST OKLAHOMA CITY OKLA

AVIATION MEDICINE TRANSLATIONS: ANNOTATED  
BIBLIOGRAPHY OF RECENTLY TRANSLATED MATERIAL. IV, (U)

JAN 66 15P ALLEN, MARY ELLEN ; CRAIN,  
RUTH ANN ;  
MONITOR: FAA-AM 66-2

UNCLASSIFIED REPORT

DESCRIPTORS: (\*AVIATION MEDICINE, BIBLIOGRAPHIES),  
ABSTRACTS, VERTIGO, NYSTAGMUS, HYPOXIA, VISION, HIGH  
ALTITUDE, DRUGS, HEARING, DECOMPRESSION, VESTIBULAR  
APPARATUS, BLACKOUT(PHYSIOLOGY), HUMAN FACTORS  
ENGINEERING, PROPRIOCEPTION, SONIC BOOM, ACCELERATION  
TOLERANCE, SPACE PERCEPTION, STRESS(PHYSIOLOGY) (U)

AN ANNOTATED BIBLIOGRAPHY OF TRANSLATIONS OF  
FOREIGN-LANGUAGE ARTICLES IS PRESENTED. THE 25  
LISTED ENTRIES ARE CONCERNED WITH STUDIES IN AVIATION  
MEDICINE, VERTIGO AND NYSTAGMUS, PHYSICAL SCIENCE,  
HYPOXIA, VISION, ALTITUDE, DRUGS, BINAURAL HEARING,  
TIME SHIFTS, GRAVITY EFFECTS, PERCEPTION,  
DECOMPRESSION, AND SONIC BOOM. PROCEDURES FOR  
OBTAINING COPIES OF THE TRANSLATIONS ARE INCLUDED.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 655 310 1/2 5/10 5/5 13/13  
20/1

STANFORD RESEARCH INST MENLO PARK CALIF

SONIC BOOM EXPERIMENTS AT EDWARDS AIR FORCE  
BASE.

(U)

DESCRIPTIVE NOTE: INTERIM REPT.

JUL 67 410P

CONTRACT: AF 49(638)-1758

PROJ: SRI-ETU-6065

MONITOR: NSBEO 1-67

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, RESPONSE),  
(\*REACTION(PSYCHOLOGY), SONIC BOOM), (\*STRUCTURES, SONIC  
BOOM), ANIMALS, HUMANS, SUPERSONIC AIRCRAFT, AIRCRAFT  
NOISE, PROPAGATION, DAMAGE, ACCEPTABILITY, TESTS,  
SEISMOLOGY (U)  
IDENTIFIERS: SUPERSONIC TRANSPORTS (U)

A SERIES OF TESTS WAS CONDUCTED IN WHICH HUMAN  
SUBJECTS (LOCATED INDOORS AND OUTDOORS), SPECIAL  
TEST STRUCTURES, AND ANIMALS WERE EXPOSED TO BOOMS  
FROM F-104, F-106, B-58, SR-71, AND XB-70  
SUPERSONIC AIRCRAFT, AND THE NOISE FROM KC-135 AND  
WC-135B SUBSONIC AIRCRAFT. PHYSICAL  
MEASUREMENTS WERE MADE OF THE SONIC BOOM SIGNATURES,  
SUBSONIC AIRCRAFT NOISE, AND THE RESPONSE OF  
STRUCTURES TO THE BOOMS AND NOISE. PSYCHOLOGICAL  
MEASUREMENTS WERE MADE OF THE SUBJECTIVE  
ACCEPTABILITY TO SEVERAL HUNDRED SUBJECTS OF THE  
BOOMS AND SUBSONIC AIRCRAFT NOISE. DETAILS OF THE  
TEST PLAN AND PROCEDURES, AND THE RESULTS OF THE DATA  
ANALYZED TO DATE ARE PRESENTED. (AUTHOR) (U)



UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZUM09

AD- 655 603 1/3 14/1 5/3  
DEPARTMENT OF COMMERCE WASHINGTON D C

SST AN ECONOMIC ANALYSIS. PART 1. EXECUTIVE SUMMARY, (U)

MAR 65 170P CONNOR, JOHN T. I

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-655 604 AND AD-655 605.

DESCRIPTORS: (\*SUPERSONIC AIRCRAFT, ECONOMICS),  
(\*TRANSPORT AIRCRAFT, ECONOMICS), FEASIBILITY STUDIES,  
DECISION MAKING, DESIGN, COSTS, AIR TRANSPORTATION,  
SONIC BOOM, SPECIFICATIONS, AIRCRAFT INDUSTRY, COST  
EFFECTIVENESS, ANALYSIS (U)  
IDENTIFIERS: SUPERSONIC TRANSPORTS (U)

CONTENTS: AUTHORITY FOR STUDY; STATEMENT OF  
THE PROBLEM; POLICY ISSUES; PRICE, COMPETITION,  
AND RISK-SHARING; AIRCRAFT CONSIDERED; SUMMARY OF  
RESULTS AND POLICY CONSIDERATIONS; STUDY APPROACH;  
AIRCRAFT DESCRIPTIONS; ESTIMATING MARKETS FOR AIR  
TRANSPORT AND AIRCRAFT; RANKING OF PROGRAM  
ALTERNATIVES; ECONOMIC SIGNIFICANCE OF SONIC BOOM;  
SST PROGRAM FINANCING; BALANCE OF PAYMENTS  
EFFECTS. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 655 604 1/3 14/1 5/3  
DEPARTMENT OF COMMERCE WASHINGTON D C

SST AN ECONOMIC ANALYSIS. PART I. EXECUTIVE  
SUMMARY, PRELIMINARY SUPPLEMENT I,

(U)

APR 65 90P CONNOR, JOHN T. ;

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-655 603.

DESCRIPTORS: (\*SUPERSONIC AIRCRAFT, ECONOMICS),  
(\*TRANSPORT AIRCRAFT, ECONOMICS), FEASIBILITY STUDIES,  
SONIC BOOM, COST EFFECTIVENESS, MANAGEMENT PLANNING AND  
CONTROL, ANALYSIS, COSTS, AIRCRAFT INDUSTRY (U)  
IDENTIFIERS: SUPERSONIC TRANSPORTS (U)

CONTENTS: PURPOSE AND SCOPE; PROGRAM  
ALTERNATIVES; PROSPECTUS (CONTINUATION OF THE  
SST PROGRAM, TERMINATION OF THE SST PROGRAM);  
COST-BENEFIT ANALYSIS (PROGRAM RANKING, POLICY  
ISSUES, SENSITIVITY ANALYSIS, COMPARATIVE CASH  
FLOWS).

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMD9

AD- 655 608 1/3 14/1 5/3  
INSTITUTE FOR DEFENSE ANALYSES ARLINGTON VA ECONOMIC AND  
POLITICAL STUDIES DIV

SST AN ECONOMIC ANALYSIS. PART III. CONTRACTOR'S  
REPORTS. C. SONIC BOOM. (U)

DESCRIPTIVE NOTE: SPECIAL REPT.,  
DEC 64 150P ASHER, NORMAN J. IDZIUBAN,  
STANLEY W. HAMBURGER, WILLIAM J

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-655 607.

DESCRIPTORS: (\*SUPERSONIC AIRCRAFT, ECONOMICS),  
(\*TRANSPORT AIRCRAFT, ECONOMICS), SONIC BOOM, DAMAGE,  
COSTS, ANALYSIS, BUILDINGS, MATHEMATICAL MODELS, COST  
EFFECTIVENESS (U)  
IDENTIFIERS: SUPERSONIC TRANSPORTS (U)

THE PURPOSE OF THE STUDY IS TO ESTIMATE CLAIMS  
COSTS RESULTING FROM THE SONIC BOOM OF THE SST, AND  
TO EXAMINE TRADEOFFS BETWEEN THESE COSTS AND AIRCRAFT  
OPERATING COSTS FOR VARIOUS OPERATING PROCEDURES  
DESIGNED TO REDUCE CLAIMS COSTS. CLAIMS FOR DAMAGE  
TO GROUND STRUCTURES COMPRISE BY FAR THE LARGEST  
CATEGORY OF CLAIMS. BASED ON THE OKLAHOMA CITY  
DATA, THE MAJOR ITEM OF COST WAS ADMINISTRATIVE  
HANDLING OF THE CLAIMS. ACTUAL PAYMENTS FOR  
ALLEGED DAMAGES WERE SMALL. THE OKLAHOMA CITY  
CLAIMS DATA ARE REPRESENTATIVE OF THE SITUATION THAT  
MAY EXIST IN THE US AND CANADA DURING THE SST  
OPERATIONS. HOWEVER, THEY ARE ALMOST CERTAINLY NOT  
REPRESENTATIVE OF THE SITUATION THAT WILL BE FOUND IN  
OTHER AREAS OF THE WORLD. SST OPERATIONS SHOULD  
NOT DAMAGE THE BASIC STRUCTURE OF REASONABLY WELL-  
CONSTRUCTED BUILDINGS. IT IS NOT CLEAR THAT AN  
AIRLINE (OR THE FEDERAL GOVERNMENT, FOR THAT  
MATTER) WOULD BE LIABLE FOR SONIC BOOM DAMAGE  
RESULTING FROM THE OPERATION OF A COMMERCIAL  
TRANSPORT, FLOWN IN ACCORDANCE WITH FLIGHT RULES AND  
PROCEDURES PRESCRIBED BY THE FEDERAL GOVERNMENT. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY. SEARCH CONTROL NO. /ZOM09

AD- 661 840 20/1 1/3  
FEDERAL AVIATION ADMINISTRATION WASHINGTON D C

THE SUPERSONIC TRANSPORT: THE SONIC BOOM AND YOU,

(U)

67 40P POWERS, JOHN O. (POWER,  
KENNETH ;

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SUPERSONIC AIRCRAFT, SONIC BOOM),  
(\*TRANSPORT AIRCRAFT, SONIC BOOM), (\*SONIC BOOM,  
REVIEWS), ECONOMICS, FLIGHT TESTING, DESIGN, STRUCTURES,  
STRESS(PHYSIOLOGY), STRESS(PSYCHOLOGY) (U)  
IDENTIFIERS: SUPERSONIC TRANSPORTS (U)

AN ATTEMPT WAS MADE TO OUTLINE THE HISTORICAL  
DEVELOPMENT OF THE UNITED STATES SUPERSONIC  
TRANSPORT DEVELOPMENT PROGRAM AND TO PLACE IN PROPER  
PERSPECTIVE THE NATIONAL SIGNIFICANCE OF THE SST  
PROGRAM. THE TECHNOLOGICAL ASPECTS AND PROBLEMS OF  
THE SONIC BOOM WERE REVIEWED. THE ACTUAL  
OVERFLIGHT SONIC BOOM PROGRAMS TO DATE WERE REVIEWED  
AND CAPSULE RESULTS WERE DISCUSSED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 662 003 13/13 20/1 1/2  
BLUME (JOHN A) AND ASSOCIATES SAN FRANCISCO CALIF RESEARCH  
DIV

RESPONSE OF STRUCTURES TO SONIC BOOMS PRODUCED BY XB-  
70, B-58 AND F-104 AIRCRAFT, BASED ON SONIC BOOM  
EXPERIMENTS AT EDWARDS AIR FORCE BASE. (U)

DESCRIPTIVE NOTE: FINAL REPT.,  
JUL 67 378P BLUME, JOHN A. ISHARPE,  
ROLAND L. IKOST, GARRISON IPROULX, JACQUES I  
CONTRACT: AF 49(638)-1739  
MONITOR: NSBEO 2-67

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, LOADS(FORCES)), (\*STRUCTURES,  
DAMAGE), (\*SUPERSONIC AIRCRAFT, SONIC BOOM), TESTS,  
BOMBER AIRCRAFT, FIGHTER AIRCRAFT, BUILDINGS, RESPONSE,  
DEFORMATION (U)  
IDENTIFIERS: B-58 AIRCRAFT, B-70 AIRCRAFT, F-104  
AIRCRAFT (U)

THE RESPONSE OF TEST STRUCTURES AND STRUCTURE  
ELEMENTS TO SONIC BOOMS PRODUCED BY XB-70, B-58  
AND F-104 AIRCRAFT WAS STUDIED. THESE AIRCRAFT  
PRODUCED SONIC BOOMS OF DIFFERENT SIGNATURE  
DURATIONS. THEY WERE FLOWN AT SEVERAL FLIGHT TRACK  
OFFSETS, ALTITUDES AND MACH NUMBERS SO AS TO  
GENERATE DIFFERENT OVERPRESSURE LEVELS AND SIGNATURE  
CHARACTERISTICS. FREE FIELD SIGNATURE DATA AND THE  
EFFECTS OF FREE FIELD SIGNATURE PARAMETERS ON  
STRUCTURAL RESPONSE WERE ANALYSED. STUDIES WERE  
MADE OF THE PLATE RESPONSE (LATERAL DEFORMATION)  
AND RACKING RESPONSE (IN-PLANE DEFORMATION) OF  
THE TEST STRUCTURES. DAMAGE COMPLAINTS RESULTING  
FROM THE TEST MISSIONS WERE INVESTIGATED AND THE  
RESULTS ANALYSED. THE IMPLICATIONS OF THE  
MAGNITUDES OF THE RESPONSES OF THE TEST STRUCTURES  
AND THE INVESTIGATION OF THE DAMAGE CLAIMS RESULTING  
FROM THE TEST MISSIONS ON POSSIBLE DAMAGE CAUSED BY  
SUPERSONIC FLIGHTS WERE DISCUSSED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 662 893 13/13 20/1  
DATACRAFT INC GARDENA CALIF

THEORETICAL STUDY OF STRUCTURAL RESPONSE TO NEAR-  
FIELD AND FAR-FIELD SONIC BOOMS. (U)

DESCRIPTIVE NOTE: FINAL REPT. 1 JUL-30 SEP 66,  
OCT 66 201P WIGGINS, JOHN H. , JR. ;  
KENNEDY, BRUCE ;  
REPT. NO. 3407-8  
CONTRACT: AF 49(638)-1777  
PROJ: AF-7908

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, \*STRUCTURES), INTENSITY,  
MECHANICAL WAVES, FIGHTER AIRCRAFT, BOMBER AIRCRAFT,  
RESPONSE, THEORY, LOADS(FORCES), MODELS(SIMULATIONS) (U)  
IDENTIFIERS: SUPERSONIC TRANSPORTS (U)

THE STUDY INVESTIGATES THE DIFFERENCE BETWEEN NEAR-  
FIELD AND FAR-FIELD SONIC BOOM INTENSITIES. TO DO  
SO IT DEFINES A NEW INTENSITY STANDARD, EFFECTIVE  
STATIC LOAD WHICH DEPENDS ON LOAD WAVEFORM AS WELL AS  
MAGNITUDE. MANY SONIC BOOM LOADING WAVEFORMS ARE  
COMPUTED FOR 19 STRUCTURAL ELEMENTS, OF VARIOUS  
TYPES, PRODUCED BY TWO SST DESIGNS AS WELL AS F-  
104, B-58 AND XB-70 AIRCRAFT. IT IS CONCLUDED  
THAT NEAR-FIELD BOOMS ARE LESS INTENSE THAN FAR-FIELD  
BOOMS, THE MAGNITUDE OF THE DIFFERENCE DEPENDING ON  
THE CHARACTER OF THE WAVEFORM. THE MORE THE  
WAVEFORM IS DISTORTED FROM A SYMMETRICAL FAR-FIELD  
(N-WAVE) WAVESHAPE, THE LOWER THE NEAR-FIELD  
INTENSITY. IT IS RECOMMENDED THAT FURTHER  
THEORETICAL STUDY BE MADE IN ORDER TO QUANTIFY  
RESULTS AND ISOLATE THE INFLUENCE OF SPECIFIC  
PARAMETERS ON BOOM INTENSITY. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 668 942 1/3 20/1 13/13 6/16  
5/10

NATIONAL ACADEMY OF SCIENCES - NATIONAL RESEARCH COUNCIL  
WASHINGTON D C

COMMITTEE ON SST-SONIC BOOM.

(U)

DESCRIPTIVE NOTE: STATUS REPT.

JAN 65 34P

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SUPERSONIC AIRCRAFT, \*TRANSPORT  
AIRCRAFT), (\*SONIC BOOM, COMMERCIAL PLANES), JET  
BOMBERS, STRATEGIC WEAPONS, SHOCK WAVES, STRUCTURES,  
CONSTRUCTION MATERIALS, PHYSIOLOGY,  
REACTION(PSYCHOLOGY), PSYCHOPHYSIOLOGY,  
RESPONSE(BIOLOGY), ACCEPTABILITY

(U)

IDENTIFIERS: B-70 AIRCRAFT, B-58 AIRCRAFT, \*SUPERSONIC  
TRANSPORTS

(U)

FOUR MAJOR PROBLEM AREAS ARE DISCUSSED: (1)  
GENERATION AND PROPAGATION OF SHOCK WAVES - THE  
AERONAUTICAL ASPECTS OF THE PROBLEM; (2)  
EFFECTS OF THE SONIC BOOM ON STRUCTURES AND  
STRUCTURAL MATERIAL; (3) PHYSIOLOGICAL EFFECTS  
OF THE SONIC BOOM; (4) BEHAVIORAL RESPONSE TO  
THE SONIC BOOM. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 668 943 1/3 20/1 5/10 6/16  
13/13

NATIONAL ACADEMY OF SCIENCES - NATIONAL RESEARCH COUNCIL  
WASHINGTON D C

COMMITTEE ON SST-SONIC BOOM.

(U)

DESCRIPTIVE NOTE: STATUS REPT.  
JUL 65 36P

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH  
COLUMBIA UNIV., SCHOOL OF ENGINEERING AND APPLIED  
SCIENCES, NEW YORK CITY, N. Y.

DESCRIPTORS: (\*SUPERSONIC AIRCRAFT, \*TRANSPORT  
AIRCRAFT), (\*SONIC BOOM, \*COMMERCIAL PLANES), DESIGN,  
BUILDINGS, DAMAGE, PHYSIOLOGY, REACTION(PSYCHOLOGY),  
SLEEP, PUBLIC OPINION, ACCEPTABILITY, PREDICTIONS,  
ATTITUDES(PSYCHOLOGY), PSYCHOACOUSTICS, COSTS, LAW,  
PROPAGATION, JET AIRCRAFT, SHOCK WAVES (U)  
IDENTIFIERS: OVERPRESSURE, SUPERSONIC TRANSPORTS (U)

CONTENTS: GENERATION AND PROPAGATION OF SONIC  
BOOMS - THE AERONAUTICAL ASPECTS OF THE SONIC BOOM  
PROBLEM--STATE OF KNOWLEDGE, INFLUENCE UPON AIRPLANE  
DESIGN, RESEARCH NEEDS; STRUCTURAL RESPONSE--STATE  
OF KNOWLEDGE; PHYSIOLOGICAL EFFECTS--INDIRECT ON  
\*TRIGGER\* EFFECTS, DISTURBANCE OF SLEEP;  
PSYCHOLOGICAL RESPONSE--PUBLIC ACCEPTABILITY OF THE  
SONIC BOOM (PRESENT STATUS OF KNOWLEDGE, FUTURE  
TESTING), PSYCHOACOUSTIC EFFECTS(PSYCHOLOGICAL  
ACCEPTABILITY), FUTURE RESEARCH, LEGAL AND  
INSURANCE ASPECTS, PUBLIC RESPONSE. (U)



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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 680 454 6/16 20/1  
NATIONAL ACADEMY OF SCIENCES-NATIONAL RESEARCH COUNCIL  
WASHINGTON D C COMM ON HEARING BIOACOUSTICS BIOMECHANICS

SUMMARY OF WORKING GROUP ACTIVITY FROM 1952 TO  
1968 OF THE COMMITTEE ON HEARING, BIOACOUSTICS,  
AND BIOMECHANICS. (U)

DESCRIPTIVE NOTE: HISTORICAL SUMMARY 1952-1968.  
DEC 68 SOP  
CONTRACT: NONR-2300(05)

UNCLASSIFIED REPORT

DESCRIPTORS: (HEARING, SCIENTIFIC ORGANIZATIONS),  
BIOPHYSICS, PSYCHOACOUSTICS, AUDITORY PERCEPTION, NOISE,  
REACTION(PSYCHOLOGY), AUDIOMETRY, SONAR, SONIC BOOM,  
AIRPORTS, JET ENGINE NOISE, GUIDED MISSILES, ROCKET  
ENGINES, SPEECH (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 680 800 20/1 6/19 5/10 13/13  
1/2

AEROSPACE MEDICAL RESEARCH LABS WRIGHT-PATTERSON AFB  
OHIO

SONIC BOOMS RESULTING FROM EXTREMELY LOW-ALTITUDE  
SUPERSONIC FLIGHT: MEASUREMENTS AND OBSERVATIONS ON  
HOUSES, LIVESTOCK AND PEOPLE. (U)

DESCRIPTIVE NOTE: FINAL REPT.,  
OCT 68 31P NIXON, C. W. HILLE, H. K.  
; SOMMER, H. C. ; GUILD, ELIZABETH ;  
REPT. NO. AMRL-TR-68-52  
PROJ: AF-7231  
TASK: 723103

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SUPERSONIC FLIGHT, LOW ALTITUDE), (\*SONIC  
BOOM, RESPONSE), (\*STRESS(PHYSIOLOGY), SONIC BOOM),  
STRESS(PSYCHOLOGY), REACTION(PSYCHOLOGY), JET FIGHTERS,  
PRESSURE, STRUCTURES, ANIMALS, HUMANS,  
HOUSING(DWELLINGS), PSYCHOACOUSTICS, GLASS, RUPTURE,  
RESPONSE(BIOLOGY), SITE SELECTION, MILITARY TRAINING (U)  
IDENTIFIERS: F-4C AIRCRAFT, F-4 AIRCRAFT,  
OVERPRESSURE (U)

SONIC BOOMS GENERATED BY F-4C AIRCRAFT FLYING  
LOW-LEVEL TERRAIN-FOLLOWING PROFILES DURING JOINT  
TASK FORCE II OPERATIONS NEAR TONOPAH,  
NEVADA, WERE RECORDED UNDER AND NEAR THE FLIGHT  
TRACKS, AND RESPONSES OF STRUCTURES, ANIMALS, AND  
PEOPLE WERE OBSERVED. RECORDED OVERPRESSURES UP TO  
144 PSF WERE ANALYZED, CORRELATED WITH AVAILABLE  
AIRCRAFT OPERATIONS DATA, AND COMPARED WITH DATA FROM  
DIFFERENT AIRCRAFT FLYING SIMILAR PROFILES.  
OBSERVATIONS OF STRUCTURES, ANIMALS, AND PEOPLE  
WERE CORRELATED WITH THE MEASURED OVERPRESSURES.  
RESULTS INCLUDE ACQUISITION OF NEAR-FIELD  
RECORDINGS OF OVERPRESSURES GENERATED BY THE F-  
4C, THE FINDING THAT SOME WINDOW GLASS FRAGMENTS  
WERE PROPELLED A SHORT DISTANCE RATHER THAN FALLING  
DIRECTLY BELOW THE WINDOW, AN INSTANCE IN WHICH THE  
MEASURED OVERPRESSURE OF A SONIC BOOM 1 MILE TO THE  
SIDE OF THE TRACK FAR EXCEEDED THE PREDICTED VALUE,  
THE FINDING THAT LIVESTOCK (UNDETERMINED PRIOR  
EXPOSURE TO ACOUSTIC STIMULI IN THIS SITUATION) DID  
NOT RESPOND ADVERSELY TO THE SONIC BOOMS,

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 682 050 20/1 1/3 1/2 20/4  
1/1

BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH FLIGHT  
SCIENCES LAB

AN ANALYSIS OF THE POSSIBILITY OF REDUCTION OF SONIC  
BOOM BY ELECTRO-AERODYNAMIC DEVICES, (U)

SEP 68 45P CHENG, SIN-I ; GOLDBURG,  
ARNOLD ;  
REPT. NO. DI-82-0764  
MONITOR: IDEP 347.60.00.00-C6-10

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH  
PRINCETON UNIV., N. J., DEPT. OF AEROSPACE AND  
MECHANICAL SCIENCES.

DESCRIPTORS: (SONIC BOOM, REDUCTION), ELECTRIC  
DISCHARGES, IONS, ELECTRONS, INTERACTIONS, POWER  
SUPPLIES, DEFLECTION, SUPERSONIC FLOW, THRUST,  
SUPERSONIC AIRCRAFT, TRANSPORT AIRCRAFT, COMMERCIAL  
PLANES, WEIGHT, FEASIBILITY STUDIES, AERODYNAMIC  
NOISE (U)  
IDENTIFIERS: SUPERSONIC TRANSPORTS (U)

THE PURPOSE OF THE PAPER IS TO INVESTIGATE THE  
PHYSICS OF ELECTRO-AERODYNAMIC TECHNIQUES FOR  
REDUCING THE SONIC BOOM AND TO DRAW CONCLUSIONS AS TO  
THE USEFULNESS OF THE PROPOSED TECHNIQUES. AN  
ANALYSIS OF THE INTERACTION OF IONS AND ELECTRONS OF  
AN ELECTRIC DISCHARGE WITH NEUTRAL PARTICLES IN  
MOVING AIR ACCORDING TO A ONE-DIMENSIONAL MODEL IS  
DESCRIBED AND ANALYZED. A SIMPLE EXPRESSION FOR  
THE CHANGE OF TOTAL STREAM THRUST BY THE ELECTRIC  
WIND MECHANISM IS GIVEN. THE ELECTRIC POWER  
REQUIRED FOR MAINTAINING THE DISCHARGE IS CALCULATED.  
WITH THESE BASIC RESULTS, THE SPECIFIC POWER  
REQUIREMENT OF THE ELECTRO-AERODYNAMIC DEVICES  
PROPOSED FOR DEFLECTING THE ONCOMING AIR OF THE  
SUPERSONIC TRANSPORT IS EVALUATED TO BE OF THE ORDER  
OF 1 WATT/DYNE (1/2 MEGAWATT/POUND FORCE). FOR  
10% CHANGE OF BOOM INTENSITY BY ELECTRO-AERODYNAMIC  
DEFLECTION OF THE ONCOMING STREAM THRUST, A  
COMMERCIAL SUPERSONIC TRANSPORT REQUIRES OF THE ORDER  
OF THOUSANDS OF MEGAWATTS OF ELECTRIC POWER. AT  
THE SPECIFIC WEIGHT OF 1 POUND PER KILOWATT, CLEARLY  
THE ELECTRIC EQUIPMENT IS BEYOND PAYLOAD CAPABILITY.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 682 900 5/4 20/1 1/3 1/5  
STANFORD UNIV CALIF

LEGAL ASPECTS OF AIRPORT NOISE AND SONIC BOOM.  
PART I CHAPTERS I-VII,

(U)

FEB 68 214P ALTREE, LILLIAN R. ; BAXTER,  
WILLIAM F. ;  
CONTRACT: FA-67-WA-1675

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO PART 1, CHAPTERS 8-9,  
AD-682 901, AND PART 2, AD-682 902.

DESCRIPTORS: (\*LAW, \*SONIC BOOM), (\*AIRCRAFT NOISE,  
\*AIRPORTS), COSTS, DECISION MAKING, JET TRANSPORT  
PLANES, SUPERSONIC AIRCRAFT

(U)

IDENTIFIERS: COST BENEFIT ANALYSIS, LAND USE, RIGHT OF  
WAY ACQUISITION, SUPERSONIC TRANSPORTS

(U)

CONTENTS: INTRODUCTION; BASIC ECONOMICS; THE  
NATURE OF AIRPORT EXTERNALITIES; THE EFFECT OF  
EXTERNALITIES ON DECISION; A THEORETICAL ALLOCATION  
OF COSTS AND BENEFITS AND SOME PRACTICAL LIMITATIONS;  
TIME-LIMITED EASEMENTS; A MODEST STEP TOWARD  
SOLUTION; PRESENT REMEDIES FOR LOSSES CAUSED BY  
AIRPORT NOISE.

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMU9

AD- 682 901 5/4 20/1 1/3 1/5  
STANFORD UNIV CALIF

LEGAL ASPECTS OF AIRPORT NOISE AND SONIC BOOM.  
PART I CHAPTERS VIII-IX, (U)

FEB 68 116P ALTREE, LILLIAN R. ; BAXTER,  
WILLIAM F. ;  
CONTRACT: FA-67-4A-1675

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO PART 1, CHAPTERS 1-7,  
AD-682 900, AND PART 2, AD-682 902.

DESCRIPTORS: (\*LAW, \*SONIC BOOM), (\*AIRCRAFT NOISE,  
\*AIRPORTS), COSTS, JET TRANSPORT PLANES, DECISION  
MAKING, SUPERSONIC AIRCRAFT (U)  
IDENTIFIERS: RIGHT OF WAY ACQUISITION, SUPERSONIC  
TRANSPORTS (U)

PRESENT DIMENSIONS OF THE AIRPORT NOISE PROBLEM ARE  
DELINEATED AND PROPOSED SOLUTIONS ARE PRESENTED. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 682 902 5/4 20/1 1/3 1/5  
STANFORD UNIV CALIF

LEGAL ASPECTS OF AIRPORT NOISE AND SONIC BOOM.  
PART II, (U)

FEB 68 116P ALTREE, LILLIAN R. ; BAXTER,  
WILLIAM F. ;  
CONTRACT: FA-67-WA-1675

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO PART I, CHAPTERS 1-7,  
AD-682 900, AND PART I, CHAPTERS 8-9, AD-682 901.

DESCRIPTORS: (\*LAW, \*SONIC BOOM), (\*AIRCRAFT NOISE,  
\*AIRPORTS), DAMAGE, SUPERSONIC AIRCRAFT, JET TRANSPORT  
PLANES, PSYCHOPHYSIOLOGY, COSTS (U)  
IDENTIFIERS: SUPERSONIC TRANSPORTS (U)

TOPICS INCLUDE: SONIC BOOM PRODUCTION BY  
SUPERSONIC AIRPLANES; VARIATIONS IN SONIC BOOM  
STRENGTH; SONIC BOOM EFFECTS; LEGAL ASPECTS OF SONIC  
BOOM; INCLUDING RECOVERY FOR SONIC BOOM DAMAGE. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 684 806 20/1  
FEDERAL AVIATION ADMINISTRATION WASHINGTON D C

SONIC BOOM RESEARCH (1958-1968), (U)

NOV 68 23P SANDS, JOHNNY M. ;

UNCLASSIFIED REPORT

DESCRIPTORS: (SONIC BOOM, REVIEWS), UNITED STATES  
GOVERNMENT, TEST FACILITIES, TEST METHODS, THEORY,  
REPORTS, BIBLIOGRAPHIES (U)

THE UNITED STATES GOVERNMENT HAS BEEN  
ACTIVELY ENGAGED IN SONIC BOOM RESEARCH SINCE 1958 IN  
AN EFFORT TO LEARN MORE ABOUT THIS PHENOMENON AND THE  
MEANS OF CONTROLLING IT. TO THIS END, EXTENSIVE  
TESTING HAS BEEN DONE IN THE FIELD AS WELL AS IN THE  
LABORATORY ENVIRONMENT. THIS DOCUMENT IS A BRIEF  
HISTORY OF SONIC BOOM RESEARCH. PART I PRESENTS  
A CHRONOLOGICAL LISTING OF THE VARIOUS FIELD RESEARCH  
PROGRAMS, IDENTIFIES THE GOVERNMENT AGENCIES  
INVOLVED AND PROVIDES A BRIEF SUMMARY OF THE WORK  
ACCOMPLISHED. PART II DESCRIBES SOME OF THE  
LABORATORY EXPERIMENTS AND THEORETICAL STUDIES  
CONDUCTED UNDER GOVERNMENT SPONSORSHIP. PART  
III CONTAINS A LISTING OF PUBLICATIONS RESULTING  
FROM THESE RESEARCH PROGRAMS AND TELLS HOW THESE  
DOCUMENTS MAY BE OBTAINED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 687 172 20/1 19/4  
EXPLOSIVES RESEARCH AND DEVELOPMENT ESTABLISHMENT WALTHAM  
ABBAY (ENGLAND)

A NEW EXPLOSIVES TECHNIQUE FOR SYNTHESIZING A WIDE  
RANGE OF PRESSURE WAVEFORMS IN AIR. PART 2. THE  
APPLICATION OF LINEAR EXPLOSIVE CHARGES TO THE  
SIMULATION OF SONIC BANGS, (U)

OCT 68 31P HAWKINS, S. J. HICKS, J.  
A. I  
REPT. NO. ERDE-10/R/68

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO PART 1, AD-687 222.

DESCRIPTORS: (SONIC BOOM, SIMULATION), EXPLOSIVE  
CHARGES, PRESSURE, DETONATION WAVES, PROPAGATION,  
AIRBURST, NOISE, KINETIC ENERGY, GREAT BRITAIN (U)  
IDENTIFIERS: N WAVES, POINT SOURCE DISSEMINATION,  
WAVEFORMS (U)

THE CHARACTERISTICS OF THE SO-CALLED SONIC BANG ARE  
BRIEFLY REVIEWED. THE DESIRABILITY, FIELDS OF  
APPLICATION AND ADVANTAGES OF SONIC BANG SIMULANTS  
ARE CONSIDERED AND SOME POSSIBLE METHODS OF ACHIEVING  
SIMULATION DISCUSSED. AN ACCOUNT IS GIVEN OF THE  
DEVELOPMENT OF TWO TYPES OF SIMULANT USING THE  
PRINCIPLES OF THE EXTENDED EXPLOSIVE CHARGE TECHNIQUE  
DESCRIBED IN PART 1 OF THIS REPORT (ERDE 9/R/  
68). THEIR PROPERTIES ARE OUTLINED AND CRITERIA  
FOR THEIR SUITABILITY FOR DIFFERENT TYPES OF  
APPLICATION ARE PUT FORWARD TOGETHER WITH THE RESULTS  
OBTAINED ON APPLYING THESE CRITERIA TO THE TWO TYPES  
OF LINEAR CHARGE SIMULANT DEVELOPED. (AUTHOR) (U)



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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 687 175 20/1  
EXPLOSIVES RESEARCH AND DEVELOPMENT ESTABLISHMENT WALTHAM  
ABBEY (ENGLAND)

SOME MEASUREMENTS OF THE SONIC BANGS PRODUCED AT  
EXERCISE WESTMINSTER. (U)

DESCRIPTIVE NOTE: TECHNICAL MEMO.,  
OCT 68 38P HAWKINS, S. J. THICKS, J.  
A. ;  
REPT. NO. ERDE-17/M/68

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, SIMULATION), MEASUREMENT,  
STANDARDS, EXPLOSIVES, RECORDS, STRUCTURES, SHOCK WAVES,  
GREAT BRITAIN (U)

OPPORTUNITY WAS TAKEN AT EXERCISE WESTMINSTER  
TO MAKE RECORDINGS OF SONIC BANG WAVEFORMS FOR USE  
AS STANDARDS OF COMPARISON BY WHICH THE EXPLOSIVELY  
GENERATED SIMULANT WAVEFORM UNDER DEVELOPMENT AT  
ERDE COULD BE JUDGED. A VARIATION OF THE SONIC  
BANG WAVEFORM ALONG THE AIRCRAFT TRACK, FIRST  
REPORTED IN THE USA, WAS OBSERVED IN THIS COUNTRY  
FOR THE FIRST TIME. FROM THE RECORDED WAVEFORMS,  
ENERGY SPECTRA AND LOUDNESS VALUES WERE COMPUTED,  
CORRESPONDING TO THE MEDIAN AND EXTREME FORMS OF THE  
VARIATION. IT IS CONCLUDED THAT (1) THE  
SUBJECTIVE EFFECTS OF SONIC BANGS CAN VARY MARKEDLY  
WITH THE LOCATION OF THE OBSERVER ALONG THE AIRCRAFT  
TRACK, EVEN THOUGH THE FLIGHT CONDITIONS AND LOCAL  
TOPOGRAPHY ARE CONSTANT, AND (2) THE ERDE MARK  
I EXPLOSIVE SIMULANT IS VERY SUITABLE FOR THE  
ASSESSMENT OF THE EFFECTS OF SONIC BANGS ON BUILDING  
STRUCTURES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 687 222 1971 1974  
EXPLOSIVES RESEARCH AND DEVELOPMENT ESTABLISHMENT WALTHAM  
ABBEY (ENGLAND)

A NEW EXPLOSIVES TECHNIQUE FOR SYNTHESIZING A WIDE  
RANGE OF PRESSURE WAVEFORMS IN AIR. PART I.  
APPROXIMATE THEORY OF AIR BLAST FROM EXTENDED  
EXPLOSIVE CHARGES, (U)

OCT 68 29P HAWKINS, S. J. HICKS, J.  
A. I  
REPT. NO. ERDE-9/R/68

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO PART 2, AD-687 172.  
ALSO AVAILABLE FROM MINTECH, TIL, BLOCK 'A',  
STATION SQUARE, ST. MARY CRAY, ORPINGTON,  
KENT. BR5 3RE.

DESCRIPTORS: (EXPLOSIVE CHARGES, BLAST); SHOCK WAVES,  
PROPAGATION, CONFIGURATION, AIRBURST, PRESSURE, WAVEFORM  
GENERATORS, SONIC BOOM, HYDRODYNAMICS, GREAT  
BRITAIN (U)

A NEW TECHNIQUE FOR GENERATING AIR BLAST WAVES  
USING SPATIALLY EXTENDED EXPLOSIVE CHARGES HAS BEEN  
DEVELOPED. IT HAS BEEN FOUND TO BE CAPABLE OF  
SYNTHESIZING PRESSURE WAVEFORMS HAVING A WIDE RANGE  
OF SHAPES AND DURATIONS AND WAS APPLIED, AMONG OTHER  
THINGS, TO THE SIMULATION OF SONIC BANGS, THE  
APPLICATIONS OF THE TECHNIQUE BEING DESCRIBED  
SEPARATELY IN THE SECOND PART OF THE REPORT (ERDE  
10/R/68). IN THIS FIRST PART OF THE REPORT A  
PHENOMENOLOGICAL THEORY OF THE AIR BLAST FROM SUCH  
CHARGES IS DEVELOPED UNDER CERTAIN SIMPLIFYING  
ASSUMPTIONS. THESE ASSUMPTIONS ARE FIRSTLY THAT  
THE GIVEN SPATIAL DISTRIBUTION OF EXPLOSIVE MAY BE  
REDUCED TO AN EQUIVALENT LINEAR DISTRIBUTION IN THE  
LINE-OF-SIGHT BY MAKING AN EXTENSION OF THE 'ENERGY  
HYPOTHESIS' COMMONLY APPLIED TO THE CASE OF  
SPHERICALLY SYMMETRIC EXPLOSIONS. SECONDLY, THIS  
LINEAR DISTRIBUTION IS IN TURN REGARDED AS AN  
INFINITE SET OF ELEMENTARY LINEAR CHARGE ELEMENTS  
GENERATING ACOUSTIC WAVELETS THE COMBINED EFFECTS OF  
WHICH ARE OBTAINED BY LINEAR SUPERPOSITION. FOR  
SUCH A MODEL OF THE AIR BLAST PROCESS, THE PRESSURE  
WAVE IN THE FAR FIELD MAY BE REPRESENTED EXACTLY IN  
TERMS OF AN ASSUMED SHAPE OF ELEMENT WAVEFORM.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZUM09

AD- 687 491 1/3 20/1 20/4 1/1  
ARA INC WEST COVINA CALIF

GAP EFFECTS OF A SHARP EDGED DELTA WING AT  
SUPERSONIC SPEEDS, (U)

FEB 69 58P MAZELSKY, BERNARD ; CHAO, CHIA-  
CHUN ; SHEN, CHENG-CHUNG ;  
REPT. NO. ARA-102  
CONTRACT: F44620-68-C-0027  
PROJ: AF-9781  
TASK: 978101  
MONITOR: AFOSR 69-0846TR

UNCLASSIFIED REPORT

DESCRIPTORS: (\*WING SLOTS, SONIC BOOM), (\*SONIC BOOM,  
DELTA WINGS), (\*DELTA WINGS, SUPERSONIC  
CHARACTERISTICS), LEADING EDGES, MODEL TESTS, LIFT,  
DRAG, CAMBER, REYNOLDS NUMBER, PRESSURE, SHOCK WAVES,  
PITCH(MOTION), SWEEPBACK WINGS, ANGLE OF ATTACK (U)  
IDENTIFIERS: LIFT DRAG RATIO, SHARP BODIES (U)

SONIC BOOM MEASUREMENTS WERE CONDUCTED TO EVALUATE  
THE EFFECTS OF A LEADING SLAT WITH VARIOUS DEGREES OF  
CAMBER AND GAP SIZE BETWEEN THE SLAT AND THE MAIN  
WING ON A 70 DEG SWEEP DELTA WING AT SUPERSONIC  
SPEEDS. THE MODEL WAS SIZED FOR SONIC BOOM  
MEASUREMENTS IN A WIND TUNNEL. IN ADDITION TO  
THESE MEASUREMENTS, THE MODEL WAS INSTRUMENTED WITH  
SEVERAL PRESSURE TAPS FOR INDICATING THE FLOW THROUGH  
THE GAP. AS A SEPARATE WIND TUNNEL ENTRY, FORCE  
MEASUREMENTS WERE ALSO TAKEN TO INDICATE THE EFFECT  
OF THE CAMBERED SLAT ON THE PITCH STABILITY AND LIFT-  
DRAG RATIO. DUE TO THE SMALL SIZE OF THE MODEL  
REQUIRED TO MEASURE THE SONIC BOOM, THE GAP  
CONFIGURATION WAS SUCH THAT THE AIRFLOW WAS NORMAL TO  
THE WING SURFACE. FOR OPTIMUM LIFT AND DRAG  
PERFORMANCE, THE GAP SHOULD BE DESIGNED SUCH THAT THE  
FLOW FROM THE UPPER SURFACE SHOULD BE TANGENTIAL TO  
THE UPPER SURFACE. A SECOND MODEL HAS BEEN  
CONSTRUCTED TO EVALUATE THE LIFT-DRAG PROBLEM  
SEPARATELY BY INCREASING THE SIZE OF THE MODEL SUCH  
THAT THE PROPER GAP CONFIGURATIONS CAN BE FABRICATED.  
REGARDLESS OF THE NON-OPTIMIZATION OF THE GAPS, THE  
FOLLOWING RESULTS WERE ESTABLISHED BY THIS PHASE OF  
THE PROGRAM. (1) THE EFFECT OF CAMBER RESULTS  
IN AN INCREASE IN (L/D)MAX. (2) THE EFFECT  
OF REYNOLDS NUMBER ON (L/D)MAX IS NEGLIGIBLE  
WHEN THE GAP IS CLOSED. HOWEVER, FOR A VERY SMALL  
GAP, (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMU9

AD- 689 844 20/1 5/10  
STANFORD RESEARCH INST MENLO PARK CALIF

PSYCHOLOGICAL EXPERIMENTS ON SONIC BOOMS CONDUCTED  
AT EDWARDS AIR FORCE BASE. (U)

DESCRIPTIVE NOTE: FINAL REPT.

AUG 68 119P KRYTER, K. A. ; JOHNSON, P.

J. ; YOUNG, J. R. ;

CONTRACT: AF 49(638)-1758

PROJ: SRI-ETU-6065

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, \*PSYCHOACOUSTICS), AIRCRAFT  
NOISE, ACCEPTABILITY, INTENSITY, AUDITORY PERCEPTION,  
SUBSONIC CHARACTERISTICS, SUPERSONIC AIRCRAFT, WEATHER,  
STRUCTURES, RESPONSE (U)

A SERIES OF TESTS WERE CONDUCTED IN JUNE 1966 AND  
OCTOBER 1966 TO JANUARY 1967 IN WHICH HUMAN  
SUBJECTS (LOCATED INDOORS AND OUTDOORS), AND  
SPECIAL TEST STRUCTURES WERE EXPOSED TO BOOMS FROM  
F-104, F-106, B-58, SR-71, AND XB-70  
SUPERSONIC AIRCRAFT, AND THE NOISE FROM KC-136 AND  
WC-135B SUBSONIC AIRCRAFT. PHYSICAL  
MEASUREMENTS WERE MADE OF THE SONIC BOOM SIGNATURES,  
SUBSONIC AIRCRAFT NOISE, AND THE RESPONSE OF  
STRUCTURES TO THE BOOMS AND NOISE. PSYCHOLOGICAL  
MEASUREMENTS WERE MADE OF THE SUBJECTIVE  
ACCEPTABILITY TO SEVERAL HUNDRED SUBJECTS OF THE  
BOOMS AND SUBSONIC AIRCRAFT NOISE. DETAILS OF THE  
TEST PLAN AND PROCEDURES, AND THE RESULTS OF THE DATA  
ANALYZED ARE PRESENTED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 691 212 20/1  
STANFORD RESEARCH INST MENLO PARK CALIF

CALCULATED UNDERWATER PRESSURE LEVELS FROM SONIC  
BOOMS. (U)

DESCRIPTIVE NOTE: INTERIM REPT. NO. 8,  
DEC 67 17P SAWYERS, KENNETH N. ;  
CONTRACT: AF 49(638)-1696

UNCLASSIFIED REPORT

DESCRIPTORS: (\*COMMERCIAL PLANES, SONIC BOOM), (\*SOUND  
TRANSMISSION, UNDERWATER), SUPERSONIC AIRCRAFT, JET  
TRANSPORT PLANES, JET PLANE NOISE, PRESSURE (U)  
IDENTIFIERS: \*NOISE POLLUTION, SUPERSONIC  
TRANSPORTS (U)

THE UNDERWATER PRESSURE LEVELS HAVE BEEN COMPUTED  
FOR TWO 'TYPICAL' SONIC BOOMS WITH AMPLITUDES OF 2.5  
PSF. THE BOOMS HAVE PERIODS OF 0.1 AND 0.3 SEC AND  
GROUND SPEEDS OF 1,500 AND 2,500 FT/SEC,  
RESPECTIVELY. THE COMPUTED LEVELS ARE COMPARED  
WITH AMBIENT LEVELS FROM VARIOUS SOURCES. IT WOULD  
APPEAR THAT AT FREQUENCIES TO WHICH THE ACOUSTIC  
RECEPTORS OF UNDERWATER ANIMALS ARE MOST SENSITIVE,  
THERE ARE OFTEN ACOUSTIC SIGNALS IN THE OCEAN THAT  
EQUAL OR EXCEED THE SIGNALS DUE TO SONIC BOOMS  
FALLING ON THE SURFACE OF THE OCEAN. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 691 496 5/3 13/13 20/1 5/2  
STANFORD RESEARCH INST MENLO PARK CALIF

REPORT ON DATA RETRIEVAL AND ANALYSIS OF USAF SONIC  
BOOM CLAIMS FILES. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
SEP 67 183P GRUBB, C. A. ; VAN ZANDT,  
J. E. ; BOCKHOLT, J. L. ;  
REPT. NO. TR-4  
CONTRACT: AF 49(638)-1696  
PROJ: SRI-ETU-5897

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, DAMAGE), (\*BUILDINGS,  
DAMAGE), (\*DAMAGE, \*COSTS), (\*INFORMATION RETRIEVAL,  
SONIC BOOM), AIR FORCE, STRUCTURAL MEMBERS, STATISTICAL  
ANALYSIS, URBAN AREAS, DECISION MAKING, DATA PROCESSING,  
GLASS (U)  
IDENTIFIERS: \*CLAIMS, \*NOISE POLLUTION (U)

GENERALLY, ABOUT THREE-FOURTHS OF ALL ALLEGED  
CLAIMS FOR DAMAGE INVOLVED SINGLE FAMILY STRUCTURES.  
COMMERCIAL STRUCTURES ACCOUNTED FOR ONE-SIXTH OF  
THE CLAIMS WITH MULTIFAMILY STRUCTURES, AUTOMOBILES,  
MISCELLANEOUS STRUCTURES, AND PEOPLE AND ANIMALS  
CONSTITUTING LESS THAN 10 PERCENT. THE STRUCTURES  
WERE 84 PERCENT OWNER OCCUPIED, 90 PERCENT IN FAIR-  
TO-SOUND CONDITION, 90 PERCENT OF ONE AND TWO  
STORIES, AND ABOUT 50 PERCENT BUILT AFTER WORLD  
WAR II. GLASS, PLASTER, AND 'OTHER' TYPES OF  
DAMAGE WERE ALMOST EQUALLY CLAIMED IN SINGLE FAMILY  
RESIDENCES; HOWEVER, GLASS WAS BY FAR THE PREDOMINANT  
TYPE IN COMMERCIAL STRUCTURES--78 PERCENT. THE  
AVERAGE PAID CLAIM ALLEGED DAMAGE OF \$93, THOUGH  
PAYMENT AVERAGED \$72. OF ALL CLAIMS, THE  
PROPORTIONS OF SINGLE FAMILY PAID AND DENIED CLAIMS  
WERE ABOUT THE SAME. ON THE OTHER HAND, CLAIMS FOR  
COMMERCIAL AND MULTIFAMILY STRUCTURES WERE MORE  
LIKELY TO BE PAID--TWO TO THREE TIMES MORE LIKELY FOR  
COMMERCIAL ESTABLISHMENTS AND 25 TO 50 PERCENT MORE  
LIKELY FOR MULTIFAMILY STRUCTURES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM09

AD- 692 340 1/3 20/1  
CORNELL UNIV ITHACA N Y

REDUCTION OF SONIC BOOM BY AZIMUTHAL REDISTRIBUTION  
OF OVERPRESSURE, (U)

JUL 68 8P GEORGE, A. R. 1  
CONTRACT: AF 49(638)-1346, NGR-33-010-054

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN AIAA JNL., V7 N2 P291-298  
FEB 69.

SUPPLEMENTARY NOTE: REVISION OF REPORT DATED 22 MAR  
68. PRESENTED AT THE AIAA/SAEROSPACE SCIENCES  
MEETING (6TH), NEW YORK CITY, 22-24 JAN 66 AS  
PAPER 68-159.

DESCRIPTORS: (\*SUPERSONIC AIRCRAFT, SONIC BOOM), (\*SONIC  
BOOM, FLOW FIELDS), SUPERSONIC FLOW, PROPAGATION, LIFT,  
WAKE, APPROXIMATION(MATHEMATICS), SLENDER BODIES,  
INTEGRAL TRANSFORMS, QUADRUPOLE MOMENT (U)

THIS PAPER ANALYZES THE POSSIBILITY OF  
REDISTRIBUTING PART OF THE THETA VARIATION OF A  
SUPERSONIC AIRCRAFT'S PRESSURE FIELD TO REDUCE THE  
SONIC BOOM OVERPRESSURE FELT BELOW THE AIRCRAFT.  
THE EFFECTS OF MULTIPOLE CONTRIBUTIONS TO THE FLOW  
ARE ANALYZED IN DETAIL. IT IS SHOWN THAT MULTIPOLE  
CONTRIBUTIONS CAN BE IMPORTANT EVEN IN THE FAR FIELD  
AND CONCEPTS FOR EFFICIENTLY EXCITING THEM ARE  
DISCUSSED. PHYSICALLY POSSIBLE MULTIPOLE  
DISTRIBUTIONS CAN BE USED TO REDUCE THE BOOM, BUT THE  
CONTRIBUTION OF LIFT TO THE BOOM CAN USUALLY BE  
REDUCED ALTHOUGH NEVER ELIMINATED IN THIS MANNER.  
THE WAVE DRAG CHANGES ASSOCIATED WITH THE FLOW  
MODIFICATIONS ARE ALSO TREATED. SOME SPECIFIC  
NUMERICAL RESULTS ARE GIVEN DEMONSTRATING BOOM  
REDUCTION AND WAVE DRAG CHANGES FOR A SPECIFIC  
SUPERSONIC TRANSPORT DESIGN. WORK STILL REMAINS TO  
BE DONE ON THE DETAILS OF CONFIGURATIONS TO BE USED  
TO PRODUCE THESE MULTIPOLE EFFECTS AND ON THEIR  
VORTEX AND SKIN-FRICTION DRAG. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 692 550 1/3 20/1  
ARMY ELECTRONICS COMMAND FORT MONMOUTH N J INST FOR  
EXPLORATORY RESEARCH

LENGTHENING OF SHOCK WAVEFORMS CAUSED BY THEIR  
PROPAGATION TO HIGH ALTITUDES, (U)

JAN 69 1P DANIELS, FRED B. I

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN THE JNL. OF THE ACOUSTICAL  
SOCIETY OF AMERICA, V45 N1 P241-242 JAN 69.

DESCRIPTORS: (•SUPERSONIC AIRCRAFT, SUPERSONIC FLIGHT),  
(•SONIC BOOM, SHOCK WAVES), ACOUSTICS, PROPAGATION,  
UPPER ATMOSPHERE, NUMERICAL ANALYSIS, SOUND (U)  
IDENTIFIERS: N WAVES (U)

EXPRESSIONS ARE GIVEN FOR THE LENGTHENING OF SHOCK  
WAVEFORMS THAT IS CAUSED BY THEIR TRAVEL UPWARDS TO  
HIGH ALTITUDES. NUMERICAL VALUES ARE COMPUTED FOR  
SPECIFIC EXAMPLES AND PRONOUNCED LENGTHENING OF THE  
WAVEFORM IS FOUND TO OCCUR. IN PARTICULAR, THE N  
WAVE FROM A SUPERSONIC TRANSPORT (SST) IS  
LENGTHENED TO A POINT WHERE IT MAY BE A SOURCE OF  
INTERFERENCE TO GEOPHYSICISTS OBSERVING INFRASOUND OF  
NATURAL ORIGIN. (AUTHOR) (U)



UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 693 132 8/13 8/11 20/1  
AIR FORCE CAMBRIDGE RESEARCH LABS L G HANSCOM FIELD  
MASS

ON THE APPLICATION OF AIR-COUPLED SEISMIC  
WAVES.

(U)

DESCRIPTIVE NOTE: ENVIRONMENTAL RESEARCH PAPERS NO. 302.  
JUL 69 43P CROWLEY, FRANCIS A. LOSSING,  
HENRY A. I  
REPT. NO. AFCRL-69-0312  
PROJ: AF-7639  
TASK: 763904

UNCLASSIFIED REPORT

DESCRIPTORS: (\*ROCKET ENGINE NOISE, \*SEISMIC WAVES),  
(\*SEISMIC WAVES, SOILS), (\*LANDING FIELDS, CRACK  
PROPAGATION), PLAYAS, CRACKS, SONIC BOOM, AIRBURST,  
LANDING FIELDS, SOIL MECHANICS  
IDENTIFIERS: F-1 ENGINES

(U)  
(U)

SEISMIC MEASUREMENTS TAKEN ON ROGERS LAKE  
PLAYA, EDWARDS AFB, CALIFORNIA, WERE PROMPTED  
BY A CONCERN THAT GROUND VIBRATIONS EXCITED BY F-1  
ROCKET ENGINES MIGHT AFFECT THE ROLE OF PLAYA  
CRACKING. THESE MEASUREMENTS RELATE TO OTHER AIR  
FORCE INTERESTS. SPECIFICALLY, THE NOTE  
CHARACTERIZES SEISMIC WAVES EXCITED BY F-1 ROCKETS,  
SONIC BOOMS, AND ATMOSPHERIC EXPLOSIONS TO:  
(1) PLAYA LANDING AREAS; (2) GROUND  
CONDITIONS AFFECTING SONIC BOOMS AND ROCKET FIRINGS  
SENSED IN BUILDINGS; (3) DETECTION OF ACOUSTIC  
SOURCES USING SEISMIC SYSTEMS; (4) THE PLAYA'S  
SELECTIVE DISTORTION OF ACOUSTIC WAVE  
CHARACTERISTICS; AND (5) CONSIDERATION OF A  
PLAYA SEISMIC ALARM SYSTEM. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 693 964 20/1 1/3  
OFFICE OF NAVAL RESEARCH LONDON (ENGLAND)

AGARD MEETING ON 'AIRCRAFT ENGINE NOISE AND SONIC  
BOOM,' FRENCH-GERMAN RESEARCH INSTITUTE, ST.  
LOUIS, FRANCE. (U)

DESCRIPTIVE NOTE: CONFERENCE REPT.,  
AUG 69 ZIP BOVERIE, RICHARD T. ;  
REPT. NO. ONRL-C-11-69

UNCLASSIFIED REPORT

DESCRIPTORS: (\*AIRPLANE ENGINE NOISE, \*SYMPOSIA),  
(\*SONIC BOOM, SYMPOSIA), SOUND TRANSMISSION, REDUCTION,  
BUILDINGS, DAMAGE, JET ENGINE NOISE, SHOCK WAVES,  
PROPAGATION, TURBOFAN ENGINES, SIMULATION (U)  
IDENTIFIERS: NOISE POLLUTION (U)

AN ANNOTATED LISTING IS GIVEN OF PAPERS PRESENTED  
DURING THE FOLLOWING SEVEN SESSIONS: SURVEY AND  
REVIEW PAPERS; ENGINE NOISE GENERATION; SONIC  
BOOM--GENERATION AND PROPAGATION; ENGINE NOISE  
REDUCTION; ENGINE NOISE; SONIC BOOM; REAL  
AIRCRAFT NOISE. (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZUM09

AD- 697 190 20/1 21/5 1/3  
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT  
PARIS (FRANCE)

AIRCRAFT ENGINE NOISE AND SONIC BOOM. (U)

DESCRIPTIVE NOTE: CONFERENCE PROCEEDINGS.  
MAY 69 565P  
REPT. NO. AGARD-CP-42

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE JOINT MEETING OF  
THE FLUID DYNAMICS PANEL AND PROPULSION AND  
ENERGETICS PANEL (33RD), SAINT-LOUIS, FRANCE,  
27-30 MAY 69. NATO FURNISHED.

DESCRIPTORS: (\*AIRPLANE ENGINE NOISE, \*SYMPOSIA),  
(\*SONIC BOOM, SYMPOSIA), (\*AIRCRAFT NOISE, SYMPOSIA),  
TURBOFAN ENGINES, REDUCTION, AIRPORTS, DESIGN,  
PSYCHOPHYSIOLOGY, SHOCK WAVES, JET PLANE NOISE,  
ATMOSPHERES, SIMULATION, JET TRANSPORT PLANES (U)  
IDENTIFIERS: C-5 AIRCRAFT, C-5A AIRCRAFT (U)

THE REPORT INCLUDES: REVIEW PAPERS DEVOTED  
RESPECTIVELY TO THE PHYSICS OF NOISE, SOME LEGAL  
PROBLEMS RELATING TO SONIC BOOM, AIRPORT DESIGN AND  
OPERATION FOR MINIMIZING EXPOSURE TO NOISE, THE  
EFFECTS OF AIRCRAFT NOISE AND SONIC BOOM ON GROUND  
STRUCTURES, HUMAN RESPONSE TO SONIC BOOMS, AND  
SPECIALIZED ASPECTS, THEORETICAL AND EXPERIMENTAL, OF  
AIRCRAFT ENGINE NOISE OR SONIC BOOM. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMU9

AD- 697 678 1/3 5/3  
FEDERAL AVIATION ADMINISTRATION WASHINGTON D C OFFICE OF  
SUPERSONIC TRANSPORT DEVELOPMENT

SUMMARY OF CURRENT ECONOMIC STUDIES OF THE UNITED  
STATES SUPERSONIC TRANSPORT. (U)

SEP 69 50P

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SUPERSONIC AIRCRAFT, \*ECONOMICS), (\*JET  
TRANSPORT PLANES, \*COMMERCIAL PLANES), AIR TRAFFIC, AIR  
TRANSPORTATION, AIRCRAFT INDUSTRY, PREDICTIONS, SONIC  
BOOM, FEASIBILITY STUDIES (U)  
IDENTIFIERS: INVESTMENT RETURNS, \*SUPERSONIC  
TRANSPORTS (U)

THE THREE STUDIES DISCUSSED IN THE REPORT PROVIDE A  
RANGE IN THEIR BASE CASE 1990 MARKET ESTIMATES FOR  
THE SST UNDER SONIC BOOM RESTRICTIONS FROM 500 TO  
800 AIRPLANES. THE LOW MARKET ESTIMATE OF 500  
SST'S, THE FAA BASE CASE, IS SUFFICIENT TO ENABLE  
THE GOVERNMENT TO RECOVER ALL OF ITS INVESTMENT FOR  
DEVELOPMENT AND CONSTRUCTION OF TWO PROTOTYPES PLUS A  
SMALL RETURN. THE BASIC CONCLUSION IS THAT THE  
PROGRAM IS NOT ONLY ECONOMICALLY VIABLE BUT  
REASONABLY PROFITABLE TO ALL PARTICIPANTS OVER A WIDE  
RANGE OF ASSUMPTIONS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 698 398 5/4 20/1 1/3  
SANTA CLARA UNIV CALIF

THE ROAR, THE WHINE, THE BOOM AND THE LAW: SOME  
LEGAL CONCERNS ABOUT THE SST, (U)

69 40P HUARD, LEO A. ;

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN SANTA CLARA LAWYER, V9 N2  
P189-226 1969.

SUPPLEMENTARY NOTE: SPONSORED BY NATIONAL AERONAUTICS  
AND SPACE ADMINISTRATION, WASHINGTON. D. C.

DESCRIPTORS: (\*LAW, \*SONIC BOOM), (\*JET TRANSPORT  
PLANES, \*COMMERCIAL PLANES), (\*SUPERSONIC AIRCRAFT,  
LAW), JET PLANE NOISE, JET ENGINE NOISE, AIRPORTS,  
AIRCRAFT INDUSTRY, REACTION(PSYCHOLOGY) (U)

IDENTIFIERS: NOISE POLLUTION, \*SUPERSONIC  
TRANSPORTS (U)

THE INQUIRY SHOWS THAT SUPERSONIC AIRPLANES MAY  
BRING ABOUT A CHANGE IN THE QUANTITY OF AIRPORT  
NOISE, BUT THEY ARE NOT LIKELY TO AFFECT THE QUALITY  
OF THAT NOISE. IT SEEMS UNLIKELY THAT THE SSTs  
WILL TRIGGER RADICAL REFORMS IN THE LEGAL RULES  
APPLICABLE TO AIRPORT NOISE, BECAUSE THEY SIMPLY WILL  
NOT MAKE A RADICAL PHYSICAL CHANGE IN SUCH NOISE.  
THE AIRPORT NOISE PROBLEM CRIES OUT FOR A CURE  
WITHOUT THE SST, AND THE ADVENT OF THAT TYPE OF  
AIRCRAFT WILL NOT IMPROVE THE SITUATION, BUT IT WILL  
NOT MAKE IT MUCH WORSE EITHER. REFORM OF 'AIRPORT'  
LAW WILL NOT FIND ITS RAISON D'ETRE IN THE SST AND  
REFORMERS MUST SEEK THEIR IMPETUS ELSEWHERE.  
(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 699 657 20/1  
TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES

AERODYNAMIC NOISE,

(U)

69 451P RIBNER, H. S. ;  
CONTRACT: AF-AFOSR-1423-68  
MONITOR: AFOSR 70-0177TR

UNCLASSIFIED REPORT

AVAILABILITY: PAPER COPY AVAILABLE FROM TORONTO  
UNIV. (ONTARIO). \$15.00.

SUPPLEMENTARY NOTE: PRESENTED AT THE PROCEEDINGS OF  
AFOSR-UTIAS SYMPOSIUM, TORONTO (ONTARIO), 20-21  
MAY 68.

DESCRIPTORS: (\*AERODYNAMIC NOISE, \*SYMPOSIA), JETS,  
BOUNDARY LAYER, AXIALLY SYMMETRIC FLOW, PRESSURE,  
IMPACT, PANELS, ATMOSPHERES, DUCTS, SHOCK WAVES,  
AIRPLANE ENGINE NOISE, PROPELLER NOISE, SONIC BOOM,  
CANADA

(U)

IDENTIFIERS: NOISE POLLUTION

(U)

CONTENTS: JETS AND NOISE; THE DEVELOPMENT OF  
ENGINEERING PRACTICES IN JET, COMPRESSOR, AND  
BOUNDARY LAYER NOISE; SCALES PERTINENT TO NOISE  
GENERATION FROM A JET; ESTIMATION OF THE INTENSITY  
OF NOISE RADIATED FROM A SUBSONIC CIRCULAR JET;  
GENERAL METHOD FOR CALCULATING THE SOUND PRESSURE  
FIELD EMITTED BY STATIONARY OR MOVING JETS; JET  
NOISE AT VERY LOW AND VERY HIGH SPEED; AN  
INVESTIGATION OF THE NEAR NOISE FIELDS OF A CHOKED  
AXI-SYMMETRIC AIR JET; NOISE FROM UNDEREXPANDED  
AXISYMMETRIC JET FLOWS USING RADIAL JET FLOW  
IMPINGEMENT; THE RESPONSE OF A SIMPLE PANEL TO THE  
PSEUDO-SOUND FIELD OF A JET; ATMOSPHERIC ABSORPTION  
OF NOISE; ATTENUATION OF SOUND IN SOFT-WALLED  
CIRCULAR DUCTS; FLOW PERTURBATIONS GENERATED BY A  
SHOCK WAVE INTERACTING WITH A ENTROPY WAVE; TRENDS  
IN BOUNDARY LAYER NOISE RESEARCH; A REVIEW OF THE  
SOUND-GENERATING MECHANISMS IN AIRCRAFT-ENGINE FANS  
AND COMPRESSORS; DISCRETE NOISE GENERATION AND  
PROPAGATION BY A FAN ENGINE; A THEORETICAL STUDY OF  
HELICOPTER ROTOR NOISE; A STUDY OF PROPELLER NOISE  
RESEARCH; REVIEW OF SONIC BOOM THEORY; RECENT  
RESULTS OF SONIC BOOM RESEARCH; SONIC BANG  
SIMULATION BY EXPLOSIVES; SECOND-ORDER WAVE  
STRUCTURE--PLANAR FLOWS; AND LIFTING AERODYNAMIC  
CONFIGURATIONS WITH NO SONIC BOOM.

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 699 915 20/1 1/2  
DEPARTMENT OF TRANSPORTATION WASHINGTON D C LIBRARY  
SERVICES DIV

AIRCRAFT NOISE AND SONIC BOOM. SELECTED  
REFERENCES.

(U)

DEC 69 46P  
REPT. NO. BIBLIOGRAPHIC LIST-2

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, \*BIBLIOGRAPHIES), (\*AIRCRAFT  
NOISE, BIBLIOGRAPHIES), MEASUREMENT, CONTROL, REDUCTION,  
STRUCTURES, RESPONSE, REACTION(PSYCHOLOGY), AIRPLANE  
ENGINE NOISE, LAW (U)  
IDENTIFIERS: \*NOISE POLLUTION (U)

CONTENTS: BIBLIOGRAPHIES; AIRCRAFT NOISE  
(GENERAL, MEASUREMENT, CONTROL, HUMAN  
RESPONSE); SONIC BOOM (GENERAL, GENERATION  
AND PROPAGATION, REDUCTION, HUMAN RESPONSE,  
STRUCTURAL RESPONSE, MISCELLANEOUS EFFECTS);  
LEGAL ASPECTS.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 700 225 20/1 1/2  
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT  
PARIS (FRANCE)

TECHNICAL EVALUATION REPORT ON AGARD SPECIALISTS'  
MEETING ON AIRCRAFT ENGINE NOISE AND SONIC BOOM, (U)

JAN 70 9P SEARS, W. R. ;  
REPT. NO. AGARD-ADVISORY-22

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: NATO FURNISHED.

DESCRIPTORS: (\*AIRPLANE ENGINE NOISE, REVIEWS), (\*SONIC  
BOOM, REVIEWS), AERODYNAMIC NOISE, REDUCTION, ENGINE  
NOISE, DESIGN (U)  
IDENTIFIERS: EVALUATION (U)

THE MEETING JUSTIFIED THE TERM 'SPECIALISTS' IN ITS  
TITLE. ONE RECEIVED THE IMPRESSION THAT ALL  
PRESENT WERE TRULY KNOWLEDGEABLE IN THIS IMPORTANT  
FIELD OF TECHNOLOGY AND THAT THEIR EXPERTISE SPANNED  
A BROAD RANGE FROM THE HIGHLY MATHEMATICAL TO THE  
SEVERELY PRACTICAL. THE MIXING OF PROPULSION AND  
FLUID-DYNAMICS SPECIALISTS WAS EMINENTLY SUCCESSFUL;  
THE DIVIDING LINE BETWEEN THE CATEGORIES WAS NEVER  
VISIBLE. CLEARLY, MUCH IMPORTANT INFORMATION WAS  
EXCHANGED THROUGHOUT THE MEETING. (AUTHOR) (U)



UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 701 854 20/4 20/1 1/1  
DEUTSCHE FORSCHUNGS- UND VERSUCHSANSTALT FUER LUFT- UND  
RAUMFAHRT E V AACHEN (WEST GERMANY)

DIE THEORIE DER KNALLAUSBREITUNG IN EINER  
GESCHICHTETEN ATMOSPHAERE (THE THEORY OF SHOCK  
WAVE PROPAGATION IN AN ISOTHERMAL  
ATMOSPHERE),

(U)

OCT 68 11P STUFF, R. ;  
REPT. NO. DFVLR-SONDERDRUCK-2

UNCLASSIFIED REPORT  
AVAILABILITY: PUB. IN ZEITSCHRIFT FUER  
FLUGWISSENSCHAFTEN, V17 N5 P156-164 1969. NO COPIES  
FURNISHED.  
SUPPLEMENTARY NOTE: TEXT IN GERMAN.

DESCRIPTORS: (\*SHOCK WAVES, PROPAGATION); (\*SONIC BOOM,  
MATHEMATICAL ANALYSIS), ACCELERATION, AXIALLY SYMMETRIC  
FLOW, DAMPING, WEST GERMANY (U)

THE CHARACTERISTIC METHOD BY K. OSWATITSCH IS  
MODIFIED WITH RESPECT TO THE CALCULATION OF SHOCK  
WAVES FROM ACCELERATED, DECELERATED AND NON  
ACCELERATED AXISYMMETRIC BODIES IN AN ISOTHERMAL  
ATMOSPHERE. FORMULAS FOR THE SONIC BANGS OF ANY  
AIRCRAFT ARE OBTAINED. THE EXPLICIT FORMULAS YIELD  
SATISFYING RESULTS FROM A DISTANCE OF TWENTY BODY  
LENGTHS UP TO INFINITY, WHEREAS THE FORMULAS BY G.  
B. WHITHAM GIVE SUFFICIENTLY EXACT RESULTS ONLY  
FROM A DISTANCE OF THOUSAND BODY LENGTHS. IN  
STATIONARY FLIGHT THE SHOCKS ARE DAMPED WITH AN ERROR  
FUNCTION AND NOT AS USUALLY ASSUMED WITH THE  $3/4$   
POWER OF THE DISTANCE. FURTHER, THE DAMPING OF THE  
SHOCK WAVES DEPENDS THE MORE ON THE ACCELERATION OR  
DECELERATION, THE LARGER THE DISTANCE FROM THE BODY  
AND THE CLOSER THE VELOCITY TO THE SPEED OF SOUND.  
THE ISOTHERMAL ATMOSPHERE INFLUENCES THE SHOCK  
STRENGTH WITH INCREASING DISTANCE. (AUTHOR) (U)

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UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 702 378 20/1 13/13  
NORTHWESTERN UNIV EVANSTON ILL DEPT OF CIVIL  
ENGINEERING

RESPONSE OF STRUCTURES SUBJECTED TO SONIC BOOMS,

(U)

68 10P HERRMANN, GEORGE ; KRAJCIKOVIC,  
DUSAN ;  
CONTRACT: AF-AFOSR-100-67  
PROJ: AF-9782  
TASK: 978201  
MONITOR: AFOSR 70-0641TH

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN PROCEEDINGS OF THE  
INTERNATIONAL ASSOCIATION FOR BRIDGE AND STRUCTURAL  
ENGINEERING CONGRESS (8TH) NEW YORK, N. Y.

9-14 SEP 68, P1149-1155.

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH  
INGERSOLL-RAND RESEARCH CENTER, PRINCETON, N.  
J.

DESCRIPTORS: (\*SONIC BOOM, DAMAGE), (\*STRUCTURES,  
RESPONSE), AERODYNAMIC LOADING, PRESSURE, VIBRATION,  
BEAMS(STRUCTURAL), RESONANT FREQUENCY, DIFFERENTIAL  
EQUATIONS

(U)

IT IS SUGGESTED THAT THE LOADING ON STRUCTURES  
INDUCED BY THE SONIC BOOM GENERATED BY SUPERSONIC  
AIRCRAFT CAN BE REPRESENTED BY A DIPOLE IN TIME.  
THE TERM 'BIPULSE' IS INTRODUCED FOR THIS TYPE OF  
TRANSIENT LOADING. IT IS SHOWN THAT SIMPLE  
STRUCTURES SUBJECTED TO SUCH BIPULSE LOADING MAY BE  
CONVENIENTLY ANALYZED AND THE RESPONSE READILY  
COMPARED WITH THAT DUE TO OTHER TYPES OF DYNAMIC  
EFFECTS SUCH AS, FOR EXAMPLE, STEP LOADING AND  
IMPULSIVE LOADING. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 704 606 13/13 20/1  
STANFORD RESEARCH INST MENLO PARK CALIF

RESPONSE OF WINDOWS TO SONIC BOOMS. (U)

DESCRIPTIVE NOTE: INTERIM TECHNICAL REPT. NO. 7,  
JUN 67 115P SEAMAN, L. ;  
CONTRACT: AF 49(638)-1696  
PROJ: SRI-ETU-5897

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, STRUCTURES), (\*STRUCTURAL  
MEMBERS, AERODYNAMIC LOADING), (\*GLASS, RUPTURE),  
RESPONSE, PRESSURE, STRESSES, DEFLECTION, MATHEMATICAL  
PREDICTION (U)  
IDENTIFIERS: \*WINDOWS, \*WINDOW GLASS (U)

A METHOD FOR CALCULATING THE RESPONSE OF SIMPLY  
SUPPORTED WINDOWS TO SONIC BOOMS WAS DEVELOPED. THE  
PROCEDURE IS BASED ON A LINEAR ONE-DEGREE-OF-FREEDOM  
ANALYSIS PLUS ESTIMATES OF THE IMPORTANCE OF  
NONLINEAR AND MULTIMODAL EFFECTS. EFFECTS OF STRESS  
RAISERS AND OF MOVEMENT FOLLOWED BY IMPACT OF LOOSE  
WINDOWS ARE NOT CONSIDERED. SIGNIFICANT  
CONTRIBUTIONS TO THE MAXIMUM STRESS IN WINDOWS  
SUBJECTED TO 2 PSF SONIC BOOMS ARE MADE BY LARGE  
DEFLECTIONS (NONLINEARITIES), MODES ABOVE THE  
FUNDAMENTAL, AND THE INTERNAL PRESSURE BUILT UP IN  
THE BUILDING BY THE BOOM. AN ATTEMPT TO ESTIMATE  
STATISTICALLY THE OCCURRENCE OF WINDOW FAILURE UNDER  
2 PSF BOOMS WAS FRUSTRATED BY THE LACK OF PRECISE  
KNOWLEDGE OF THE STATISTICAL DISTRIBUTION OF GLASS  
STRENGTH. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 709 514 20/1  
DEUTSCHE FORSCHUNGS- UND VERSUCHSANSTALT FUER LUFT- UND  
RAUMFAHRT E V AACHEN (WEST GERMANY)

DIE VERTIKALE AUSBREITUNG VON EBENEN STÖßWELLEN IN  
EINER SCHWEREGESCHICHTENTEN ATMOSPHERE MIT EINEM  
TEMPERATURGRADIENTEN (THE VERTICAL PROPAGATION  
OF HOMOGENEOUS SHOCK WAVES IN A HEAVILY  
STRATIFIED ATMOSPHERE WITH TEMPERATURE  
GRADIENTS),

(U)

NOV 69 6P STUFF,ROLAND ;

UNCLASSIFIED REPORT  
AVAILABILITY: PUB. IN ZEITSCHRIFT FUER  
FLUGWISSENSCHAFTEN; V18 N2/3 P80-83 1970. NO COPIES  
FURNISHED.  
SUPPLEMENTARY NOTE: TEXT IN GERMAN, ATTACHED SUMMARY  
IN ENGLISH.

DESCRIPTORS: (\*SHOCK WAVES, PROPAGATION); VELOCITY,  
PERTURBATION THEORY; ATMOSPHERIC TEMPERATURE; WEST  
GERMANY; SONIC BOOM

(U)

AN ANALYTIC SOLUTION IS FOUND FOR A PLANE ACOUSTIC  
WAVE MOVING UP- AND DOWNWARD IN A POLYTROPIC  
ATMOSPHERE. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZUM09

AD- 710 888 20/1 1/2  
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT  
PARIS (FRANCE)

TECHNICAL EVALUATION REPORT ON AGARD SPECIALISTS'  
MEETING ON 'AIRCRAFT ENGINE NOISE AND SONIC  
BOOM'. (U)

DESCRIPTIVE NOTE: ADVISORY REPT.,  
JUN 70 8P POWERS, JOHN G. PIANKO, M.  
;  
REPT. NO. AGARD-AR-26-70

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: NATO FURNISHED. SEE ALSO AD-700  
225.

DESCRIPTORS: (\*AIRPLANE ENGINE NOISE, \*REVIEWS), (\*SONIC  
BOOM, REVIEWS), AERODYNAMIC NOISE, FANS, COMPRESSOR  
NOISE, SOURCES, DESIGN, CONTROL, REDUCTION (U)

CONTENTS: AIRCRAFT NOISE SOURCE; NOISE  
PREDICTION; JET NOISE SOURCE; FAN AND COMPRESSOR  
NOISE SOURCE; DESIGN FOR NOISE SOURCE CONTROL;  
ACOUSTIC PATH CONTROL; ACOUSTIC IMPACT ON  
RECEIVER. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 711 124 20/1  
DOUGLAS AIRCRAFT CO LONG BEACH CALIF

SONIC BOOM MODELING INVESTIGATION OF TOPOGRAPHICAL  
AND ATMOSPHERIC EFFECTS. (U)

DESCRIPTIVE NOTE: FINAL REPT. JUN 69-JUL 70,  
JUL 70 214P BAUER, A. B. ; BAGLEY, C.  
J. ;

REPT. NO. MDC-J0734/01  
CONTRACT: FA-69-WA-2114  
MONITOR: FAA-NO 70-10

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, \*ATMOSPHERIC MOTION),  
(\*TERRAIN, SONIC BOOM), GEOMETRIC FORMS, TURBULENCE,  
INTERACTIONS, JETS, MATHEMATICAL MODELS (U)

AN EXPERIMENTAL PROGRAM WAS UNDERTAKEN TO STUDY THE EFFECTS OF TOPOGRAPHICAL AND STRUCTURAL SHAPES ON SONIC BOOM FOCUSING AND TO STUDY THE EFFECTS OF ATMOSPHERIC TURBULENCE ON SONIC BOOM SIGNATURES. THESE EFFECTS WERE MODELED BY FIRING PROJECTILES AND BY ALLOWING THE PROJECTILE N WAVES TO INTERACT WITH MODEL SHAPES AND WITH TURBULENT JETS. THE WAVE INTERACTIONS WERE STUDIED BY MEANS OF SHADOWGRAPH PICTURES AND MICROPHONE PRESSURE RECORDS. THE BOOM FOCUSING PARAMETERS WERE RELATED TO THE WORK OF TING AND PAN. A CANYON MODEL SHOWED WAVE AMPLIFICATION FACTORS AS LARGE AS 14 FOR A SPECIAL SHAPE AND A PARTICULAR WAVE DIRECTION OF PROPAGATION. A LARGE AMOUNT OF STATISTICAL INFORMATION WAS OBTAINED FROM THE TURBULENCE INTERACTIONS. THIS INFORMATION WAS STUDIED AND FOUND TO BE IN ESSENTIAL AGREEMENT WITH THE THEORY OF CREW, BUT THE MECHANISMS OF THE SHOCK FRONT BREAKUP AND OF CERTAIN NONLINEAR FEATURES ARE NOT UNDERSTOOD. TURBULENCE SCALING PARAMETERS ARE DEVELOPED AND USED TO RELATE THE MODEL RESULTS TO FULL SCALE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 711 516 20/1  
GENERAL APPLIED SCIENCE LABS INC WESTBURY N Y

EFFECT OF GROUND REFLECTIVE AND OTHER MICROPHONE  
MOUNTING CONDITIONS ON SONIC BOOM MEASUREMENTS. (U)

DESCRIPTIVE NOTE: FINAL REPT.,  
MAY 70 72P ABELE, MANLIO ; TOMBOULIAN,  
ROGER ; PESCHKE, WILLIAM ; DANTUONO, DANIEL ;  
CONTRACT: DOT-FA60-2185  
MONITOR: FAA-NO 70-4

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, MEASUREMENT); REFLECTIVITY,  
SURFACE PROPERTIES, MICROPHONES, SOILS, ASPHALT, GLASS  
TEXTILES (U)

AN INVESTIGATION OF THE EFFECTS OF VARIOUS GROUND  
SURFACES ON THE CHARACTER OF A REFLECTED N-WAVE WAS  
PERFORMED. THE RESPONSE OF AN FAA FIELD TEST  
MICROPHONE WAS COMPARED WITH THAT OF A STANDARD  
CONDENSER MICROPHONE AND THE RESPONSE CAPABILITY OF  
AN FAA TRANSIENT DATA RECORDER WAS DETERMINED.  
THE EFFECT OF MICROPHONE HEIGHT AND WAVE INCIDENCE  
ANGLE WITH RESPECT TO BOTH A RIGID REFERENCE SURFACE  
AND SEVERAL GROUND SURFACES WAS EVALUATED IN A SONIC  
BOOM SIMULATOR. THE GROUND SURFACES TESTED INCLUDED  
ASPHALT, MEDIUM DENSITY GRASS, SPADED SOIL, COARSE  
AGGREGATE, ETC. TWO DIFFERENT N-WAVE SIGNATURES  
WERE USED IN THE TESTS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 711 963 20/1  
HYDROSPACE RESEARCH CORP ROCKVILLE MD

PENETRATION OF SONIC BOOM ENERGY INTO THE OCEAN:  
AN EXPERIMENTAL SIMULATION.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,  
JUN 70 56P WATERS, JOHN F. ; GLASS, RAY  
E. ;  
REPT. NO. HRC-TR-288  
CONTRACT: N00014-70-C-0374, FA-70-WAI-185

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SEA WATER, ACOUSTIC PROPERTIES), (\*SONIC  
BOOM, SEA WATER), (\*CIVIL AVIATION, SUPERSONIC  
AIRCRAFT), SIMULATION, HYDROPHONES, ABSORPTION, SHOCK  
WAVES, PRESSURE, ECOLOGY, EXPLOSIVE CHARGES, REFLECTION,  
MATHEMATICAL PREDICTION (U)  
IDENTIFIERS: \*AMBIENT NOISE (U)

PENETRATION OF SOUND INTO A BODY OF WATER FROM A  
SIMULATED AIRBORNE SONIC BOOM WAS MEASURED IN AN  
ACOUSTICALLY SCALED EXPERIMENT. DYNAMITE CAPS WERE  
USED TO PRODUCE SPHERICALLY SPREADING N-WAVES WHICH  
IMPINGED UPON THE WATER. MICROPHONES AT THE WATER  
SURFACE AND HYDROPHONES AT VARIOUS SHALLOW DEPTHS  
WERE USED TO MEASURE THE EXPONENTIALLY ATTENUATING  
PENETRATION OF THE AIRBORNE PRESSURE FIELD INTO THE  
WATER, UNDER TOTAL REFLECTION CONDITIONS. AGREEMENT  
BETWEEN THE SCALED EXPERIMENTAL MEASUREMENTS AND  
PREDICTIONS BASED ON EXISTING THEORY WAS GENERALLY  
GOOD. APPLICATION OF THE THEORY TO THE CASE OF  
ACTUAL SONIC BOOMS IMPINGING UPON THE OCEAN, AND  
COMPARISONS WITH MEASUREMENTS OF TYPICAL DEEP-OCEAN  
AMBIENT NOISE, INDICATE THAT UNDERWATER SONIC BOOM  
NOISE WILL BE DISCERNIBLE ONLY AT VERY LOW  
FREQUENCIES AND AT SHALLOW DEPTHS. PRESSURE  
FLUCTUATION SPECTRUM LEVELS DUE TO SURFACE WAVES WILL  
BE HIGHER THAN LEVELS DUE TO SONIC BOOMS.  
(AU: 40R) (U)



UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 716 830 20/1  
AEROSPACE RESEARCH LABS WRIGHT-PATTERSON AFB OHIO

LOWER BOUNDS FOR SONIC BOOM CONSIDERING THE  
NEGATIVE OVERPRESSURE REGION,

(U)

MAY 70 4P PETTY, JAMES S. ;  
REPT. NO. ARL-70-0297V  
PROJ: AF-7064  
TASK: 7064

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN JNL. OF AIRCRAFT, V7 N4  
P375-377 JUL-AUG 70.

SUPPLEMENTARY NOTE: REVISION OF REPORT DATED 7 JAN  
70.

DESCRIPTORS: (\*SONIC BOOM, MATHEMATICAL ANALYSIS),  
PRESSURE, SUPERSONIC AIRCRAFT, JET TRANSPORT PLANES,  
THEORY

(U)

IDENTIFIERS: OVERPRESSURE, SUPERSONIC TRANSPORTS

(U)

CONSIDERATION IS GIVEN TO BOTH THE POSITIVE AND  
NEGATIVE PARTS OF THE OVERPRESSURE SIGNATURE IN AN  
ANALYSIS OF LOWER BOUND CONFIGURATIONS FROM THE  
NONASYMPTOTIC THEORY.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 717 193 20/1  
AIR FORCE FLIGHT DYNAMICS LAB WRIGHT-PATTERSON AFB  
OHIO

CRITICAL EVALUATION OF A NONUNIFORM FLOW  
SONIC BOOM REDUCTION CONCEPT.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT. OCT 68-JUL 69.  
SEP 70 40P WEEKS, THOMAS M. ;  
REPT. NO. AFFDL-TR-70-65  
PROJ: AF-1366  
TASK: 136612

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, REDUCTION), TWO DIMENSIONAL  
FLOW, FLOW FIELDS, JETS, FLAT PLATE MODELS, LEADING  
EDGES, INTERACTIONS (U)  
IDENTIFIERS: NONUNIFORM FLOW, EVALUATION (U)

AN INVESTIGATION WAS MADE OF A 'NONUNIFORM FLOW  
FIELD' SONIC BOOM ELIMINATION DEVICE. THE TWO-  
DIMENSIONAL FLOW FIELD CONSISTS OF A SLIT JET  
IMPINGING ON AN INCLINED FAT PLATE AIRFOIL. THE  
REPORT PRESENTS INDEPENDENT ANALYSES OF THE PROBLEM  
AS WELL AS A CRITIQUE OF THE ANALYSIS. THE MAJOR  
FINDING IS THAT ONE CAN EXPECT NO MORE THAN A 10%  
REDUCTION IN THE STRENGTH OF THE LEADING EDGE SHOCK  
WAVE AT A THOUSAND CHORD LENGTHS FROM THE PLATE WHEN  
COMPARED TO THE CORRESPONDING CASE WITHOUT JET FLOW  
(SAME CHORD AND LOWER SURFACE PRESSURE). UNDER  
IDENTICAL CONDITIONS, A 20% REDUCTION IS FOUND.  
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 718 835 20/1  
BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH

FINITE DIFFERENCE CALCULATION OF THE BEHAVIOR  
OF A DISCONTINUOUS SIGNAL NEAR A CAUSTIC,

(U)

JAN 71 21P SEEBASS, R. MURMAN, E. M. ;  
KRUPP, J. A. ;  
REPT. NO. D1-82-1040

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE CONFERENCE ON  
SONIC BOOM RESEARCH (3RD), NASA HEADQUARTERS,  
WASHINGTON, D. C., 29-30 OCT 70.

DESCRIPTORS: (SONIC BOOM, WAVE PROPAGATION), TRANSONIC  
CHARACTERISTICS, PROPAGATION, INTERACTIONS, PRESSURE,  
NUMERICAL METHODS AND PROCEDURES (U)  
IDENTIFIERS: OVERPRESSURE, FINITE DIFFERENCE  
THEORY (U)

IT IS IMPORTANT TO PREDICT SONIC BOOM OVERPRESSURE  
SIGNATURES IN THE VICINITY OF A CAUSTIC. IN  
PARTICULAR, ONE NEEDS TO BE ABLE TO CALCULATE THE  
OVERPRESSURE WHEN THE CAUSTIC SURFACE INTERSECTS, OR  
WHEN IT IS NEAR THE GROUND. WHILE THE ANALYTICAL  
FORMULATION OF THIS PROBLEM IS A SIMPLE ONE, THE  
SOLUTION BY FORMAL MATHEMATICAL TECHNIQUES PRESENTS  
GREAT DIFFICULTIES. CONSEQUENTLY, THERE IS GREAT  
IMPETUS FOR DEVELOPING NUMERICAL TECHNIQUES THAT CAN  
PROVIDE SUCH PREDICTIONS. HERE THE AUTHORS REPORT  
ON THE EXTENSION TO THE CAUSTIC PROBLEM OF A  
TECHNIQUE DEVELOPED BY MURMAN AND COLE FOR  
TRANSONIC FLOWS. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 721 010 20/1 1/3  
WYLE LABS INC HUNTSVILLE ALA RESEARCH STAFF

NOISE PRIMER FOR THE SUPERSONIC  
TRANSPORT.

(U)

MAR 71 34P  
CONTRACT: FA-55-71-9

UNCLASSIFIED REPORT

DESCRIPTORS: (\*JET PLANE NOISE, \*SUPERSONIC AIRCRAFT),  
(\*JET TRANSPORT PLANES, \*COMMERCIAL PLANES), SONIC BOOM,  
LAW, UNITED STATES GOVERNMENT, JET ENGINE NOISE,  
AIRPORTS, REDUCTION, URBAN AREAS (U)  
IDENTIFIERS: \*NOISE POLLUTION, \*SUPERSONIC  
TRANSPORTS (U)

THE FIRST AIM OF THE BOOKLET IS TO CLARIFY THE  
BASIC CONCEPTS AND TERMINOLOGY NECESSARY IN ANY  
DISCUSSION OF AIRPORT-COMMUNITY NOISE AND THE SST.  
THE SECOND AIM OF THE BOOKLET IS TO DESCRIBE THE  
EXPECTED NOISE OF THE PLANNED COMMERCIAL SST--USING  
THE TERMINOLOGY AND CONCEPTS DEVELOPED TO DESCRIBE  
AIRCRAFT NOISE. THIS DESCRIPTION TRIES TO PUT SST  
NOISE INTO PERSPECTIVE BY: SUMMARIZING THE  
STATUS OF THE MAJOR EFFORTS TO REDUCE SST NOISE;  
CLARIFYING SOME OF THE OLD NUMERICAL VALUES FOR  
SST NOISE WHICH HAVE CAUSED CONFUSION; COMPARING  
THE NOISE OF THE SST WITH THAT OF OTHER AIRPLANES  
IN TERMS OF CERTIFICATION NOISE LEVELS; AND SHOWING  
HOW THE AIRPORT-COMMUNITY NOISE FROM SST OPERATIONS  
FITS INTO THE NOISE PICTURE ALONG WITH THE NEW  
AIRPLANES OF THE FUTURE. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 721 423 20/1 20/11 13/13  
EXPLOSIVES RESEARCH AND DEVELOPMENT ESTABLISHMENT WALTHAM  
ABBAY (ENGLAND)

EXPLOSIVELY GENERATED AIR PRESSURE WAVES  
FOR STRUCTURAL FORCING, (U)

APR 69 10P HARPER, M. J. HAWKINS, S.  
J. THICKS, J. A. I  
REPT. NO. ERDE-OFFPRINT-10

UNCLASSIFIED REPORT

PAPER COPY AVAILABLE FROM MINISTRY OF TECHNOLOGY  
REPORTS CENTRE, STATION SQUARE HOUSE, ST.  
MARY CRAY, ORPINGTON KENT (ENGLAND) BR5  
3RE. NO COPIES FURNISHED BY DDC OR NTIS.  
SUPPLEMENTARY NOTE: PUB. IN JNL. OF SOUND VIBRATIONS  
VII N2 P217-224 1970.

DESCRIPTORS: (•SONIC BOOM, SIMULATION), (•STRUCTURES,  
GUST LOADS), AIRBURST, BLAST, SHOCK WAVES, PRESSURE,  
INTEGRAL TRANSFORMS, GREAT BRITAIN (U)

THE AERIAL BLAST WAVE GENERATED BY A SMALL  
EXPLOSION MAY BE USED TO PRODUCE IMPULSIVE FORCING OF  
STRUCTURES WITH NATURAL PERIODS LONGER THAN  
APPROXIMATELY 1 MSEC! THE FREE RESPONSE OF SUCH  
STRUCTURES MAY THEN BE DETERMINED. A TECHNIQUE HAS  
BEEN DEVELOPED USING SPATIAL DISTRIBUTIONS OF  
EXPLOSIVE WHEREBY IT IS POSSIBLE TO GENERATE WAVES OF  
MUCH LONGER DURATIONS AND OF A MUCH WIDER RANGE OF  
SHAPES, SO THAT STUDIES OF THE FORCED RESPONSE OF  
STRUCTURES ARE MADE FEASIBLE. THE TECHNIQUE HAS  
BEEN APPLIED TO THE GENERATION OF A BLAST WAVEFORM OF  
THE SAME SHAPE AS THAT OF THE SONIC BANG, FOR  
EXAMPLE, THUS PERMITTING STUDIES OF RESPONSE TO SONIC  
BANGS TO BE CARRIED OUT WITHOUT THE NECESSITY OF  
FLYING SUPERSONIC AIRCRAFT AND WITHOUT RECOURSE TO  
SCALED MODEL EXPERIMENTS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZQM09

AD- 721 932 20/1  
BOEING SCIENTIFIC RESEARCH LABS SEATTLE WASH

NONLINEAR ACOUSTIC BEHAVIOR AT A CAUSTIC,

(U)

FEB 71 52P SEEBASS, R. I  
REPT. NO. DI-82-1039

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, MATHEMATICAL MODELS), SHOCK  
WAVES, WAVE FUNCTIONS, REFLECTION, SUPERSONIC FLIGHT,  
PARTIAL DIFFERENTIAL EQUATIONS, NONLINEAR SYSTEMS (U)  
IDENTIFIERS: COMPUTERS, GRAPHICS (U)

THE PAPER IS CONCERNED WITH MODIFYING THE BASIC  
THEORY OF SONIC BOOMS TO INCLUDE NONLINEAR EFFECTS  
NOT PROPERLY ACCOUNTED FOR IN THE NEIGHBORHOOD OF A  
CAUSTIC. THE BASIC THEORY ACCOUNTS FOR NONLINEAR  
EFFECTS ON THE PROPAGATION OF THE PRESSURE SIGNAL  
DOWN A RAY TUBE, BUT THE CONCEPT OF RAY TUBES IS A  
LINEAR ONE. THE ENVELOPE OF THE RAYS IS A CAUSTIC  
SURFACE; THIS SURFACE IS THE LOCUS OF CUSPS IN THE  
ACOUSTIC WAVE FRONTS. INTEREST IS IN THE DETAILED  
STRUCTURE OF THE WAVE FRONT AS IT REFLECTS AT A  
CAUSTIC SURFACE. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZQM09

AD- 723 112 11/2 20/1  
WYLE LABS HUNTSVILLE ALA

AN EXPERIMENTAL STUDY TO DETERMINE THE  
EFFECTS OF REPETITIVE SONIC BOOMS ON GLASS  
BREAKAGE.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,  
JUN 70 84P KAO, GEORGE C. ;  
REPT. NO. WR-70-11  
CONTRACT: FA-69-WA-2204  
MONITOR: FAA-NO 70-13

UNCLASSIFIED REPORT

DESCRIPTORS: (\*GLASS, VULNERABILITY), (\*SONIC BOOM,  
GLASS), BRITTLINESS, PREDICTIONS, SUPERSONIC FLIGHT,  
EXPERIMENTAL DATA, TEST METHODS, DAMAGE ASSESSMENT,  
MODELS(SIMULATIONS)

(U)

A PNEUMATIC PISTONPHONE SIMULATOR, DEVELOPED BY  
WYLE LABORATORIES, WAS USED UNDER THE PRESENT  
CONTRACT TO EXPERIMENTALLY DETERMINE DAMAGE POTENTIAL  
TO SINGLE STRENGTH GLASS SPECIMENS WHEN EXPOSED TO  
REPETITIVE SONIC BOOMS. THE GLASS SPECIMEN  
DIMENSIONS WERE TYPICALLY 48 INCH X 48 INCH X 3/32  
INCH. IN THESE EXPERIMENTS, PARTICULAR EMPHASIS  
WAS PLACED ON THE CUMULATIVE DAMAGE FROM A LARGE  
NUMBER OF BOOMS. PRELIMINARY STATIC STRENGTH TESTS  
WERE CONDUCTED ON TWO SIZES OF NEW (PREVIOUSLY  
UNUSED) SINGLE STRENGTH GLASS TO DETERMINE MEAN  
VALUES AND PROBABILITY DISTRIBUTIONS OF INCIPIENT  
FAILURE PRESSURES, AND A FEW SUCH TESTS WERE ALSO  
CONDUCTED FOR USED (SCRATCHED AND WEATHERED)  
GLASS SPECIMENS. AS A BY-PRODUCT, THESE TESTS  
YIELDED DATA REGARDING NONLINEAR STIFFNESS  
CHARACTERISTICS OF GLASS PANES AND THE EFFECTS OF  
BOUNDARY CONDITIONS ON THIS STIFFNESS. ALTHOUGH  
THE TEST DATA ARE LIMITED, RESULTS INDICATE THAT  
SONIC BOOM OVERPRESSURES REQUIRED TO CAUSE INCIPIENT  
FAILURE ARE NEARLY COMPARABLE TO STATIC FAILURE  
PRESSURES, AND THE PROBABILITY OF GLASS FAILURE AT  
REALISTIC SONIC BOOM OVERPRESSURES IS QUITE SMALL FOR  
PROPERLY MOUNTED NEW GLASS. FURTHER EXPERIMENTS  
WILL BE REQUIRED TO VALIDATE AND EXTEND THESE  
RESULTS. A PRELIMINARY GLASS NEIGHBORHOOD SURVEY  
WAS CONDUCTED TO DETERMINE BREAKAGE RATES UNDER  
NATURAL ENVIRONMENTS; HOWEVER, BECAUSE OF THE SMALL  
SAMPLE SIZE, THE GLASS BREAKAGE STATISTICS OBTAINED  
WERE OF LIMITED VALUE IN FORMULATING A REALISTIC  
BREAKAGE PROBABILITY MODEL.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 723 339 20/1 14/2 1/3  
GENERAL APPLIED SCIENCE LABS INC WESTBURY N Y

SONIC BOOM MODELING INVESTIGATION OF  
TOPOGRAPHIC AND ATMOSPHERIC EFFECTS.

(U)

DESCRIPTIVE NOTE: FINAL REPT. APR 69-APR 70,  
APR 70 157P PESCHKE, WILLIAM ; SLUTSKY,  
SIMON ; DANTUONO, DANIEL ;  
CONTRACT: DOT-FA69WA-2113  
MONITOR: FAA 70-12

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, MODEL TESTS); (\*SUPERSONIC  
AIRCRAFT, SONIC BOOM), ATMOSPHERES, INTERACTIONS,  
TERRAIN, TEST FACILITIES, ACOUSTIC HORNS, GAS FLOW,  
THERMAL PROPERTIES, MICROPHONES, TURBULENCE, PRESSURE,  
DIFFRACTION, MATHEMATICAL PREDICTION,  
MODELS(SIMULATIONS)  
IDENTIFIERS: OVERPRESSURE, GRAPHS(CHARTS)

(U)

(U)

THE EFFECTS OF SONIC BOOM INTERACTION WITH SEVERAL  
TOPOGRAPHIC CONFIGURATIONS AND WITH INERTIAL AND  
THERMAL TURBULENCE HAVE BEEN INVESTIGATED IN REDUCED  
SCALE UTILIZING AN ACOUSTIC HORN TYPE TEST FACILITY.  
OPERATIONS OF THE FACILITY AND THE SPECIFIC  
MODIFICATIONS REQUIRED TO GENERATE THE INERTIAL AND  
THERMAL TURBULENCE ARE DESIRED. EIGHT TOPOGRAPHIC  
MODEL CONFIGURATIONS WERE TESTED OVER A RANGE OF  
MODEL ORIENTATIONS AND WAVE INCIDENCE ANGLES  
CORRESPONDING TO MACH NUMBERS RANGING BETWEEN 1.0  
AND 1.4. REGIONS OF SIGNIFICANT OVER-PRESSURE ON  
THE MODEL SURFACE, ARISING AS A CONSEQUENCE OF WAVE  
REFLECTION PHENOMENA WERE STUDIED IN PARTICULAR.  
GOOD AGREEMENT, BOTH AS TO THE MAGNITUDE OF THE  
OVER-PRESSURE AND THE TIME OF OCCURRENCE OF THE  
PRESSURE PEAKS, WAS OBTAINED WITH THE PREDICTIONS OF  
LINEAR ACOUSTIC THEORY. (AUTHOR)

(U)



UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 723 579 20/1 1/2  
FEDERAL AVIATION ADMINISTRATION WASHINGTON D C SYSTEMS  
RESEARCH AND DEVELOPMENT SERVICE

AIRCRAFT NOISE STANDARDS AND  
REGULATIONS.

(U)

DESCRIPTIVE NOTE: SPEECH REPT. MAR-APR 71,  
APR 71 74P POWER, JOSEPH K. ;  
REPT. NO. FAA-RD-71-24

UNCLASSIFIED REPORT

DESCRIPTORS: (\*JET PLANE NOISE, \*STANDARDS), (\*UNITED  
STATES GOVERNMENT, CIVIL AVIATION), JET ENGINE NOISE,  
SONIC BOOM, TAKEOFF, AIRCRAFT LANDINGS, AIRPORTS,  
TOLERANCES (PHYSIOLOGY) (U)

THE PAPER DISCUSSES PUBLIC LAW 90-411 AND FAR  
PART 36 OF FEDERAL REGULATIONS. NOISE  
EXPOSURE FORECASTS AND VARIOUS SYSTEMS FOR RATING  
AIRCRAFT NOISE WORLD-WIDE ARE PRESENTED. NOISE  
CERTIFICATION AND AIRCRAFT RETROFIT REGULATIONS ARE  
DISCUSSED AS WELL AS AIRCRAFT OPERATIONAL PROCEDURES  
TO REDUCE NOISE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 724 344 20/1  
CATHOLIC UNIV OF AMERICA WASHINGTON D C INST OF OCEAN  
SCIENCE AND ENGINEERING

A LITERATURE SURVEY OF NOISE POLLUTION. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
MAR 71 96P SHIH, H. H. I  
REPT. NO. 71-5  
CONTRACT: N00014-69-A-0432

UNCLASSIFIED REPORT

DESCRIPTORS: (\*NOISE, \*REVIEWS), PUBLIC HEALTH,  
ENVIRONMENT, STRESS(PSYCHOLOGY), STRESS(PHYSIOLOGY),  
CONTROL, HEARING, INDUSTRIAL MEDICINE, SONIC BOOM,  
BIBLIOGRAPHIES (U)  
IDENTIFIERS: \*NOISE POLLUTION (U)

PHYSICALLY, NOISE IS A COMPLEX SOUND THAT HAS  
LITTLE OR NO PERIODICITY. HOWEVER, THE ESSENTIAL  
CHARACTERISTIC OF NOISE IS ITS UNDESIRABILITY.  
THUS, NOISE CAN BE DEFINED AS ANY ANNOYING OR  
UNWANTED SOUND. IN RECENT YEARS, THE RAPID INCREASE  
OF NOISE LEVEL IN OUR ENVIRONMENT HAS BECOME A  
NATIONAL PUBLIC HEALTH HAZARD. NOISE AFFECTS MAN'S  
STATE OF MENTAL, PHYSICAL, AND SOCIAL WELL-BEING.  
THE PROBLEM FORMS A SPECIAL TYPE OF AIR POLLUTION.  
NOISE STUDY IS A RATHER NEW SUBJECT AMONG OTHER  
BRANCHES OF SCIENCE. THE TRANSITION FROM ART TO  
NEAR-SCIENCE STARTED FROM BEFORE THE WORLD WAR  
II. THE WORK IS AN ATTEMPT TO ARRIVE AT AN  
UNDERSTANDING OF THE GENERAL SITUATION ON THE PROBLEM  
OF NOISE. THE SURVEY CONSISTS OF FOUR MAJOR  
PARTS: THE PRESENT STATUS OF NOISE POLLUTION, ITS  
SOURCES, ITS EFFECTS, AND THE CONTROL. MANY URGENT  
RESEARCH NEEDS ARE ALSO IDENTIFIED. FINALLY, LISTS  
OF TERMINOLOGY AND BIBLIOGRAPHY RELATING TO NOISE  
POLLUTION PROBLEMS ARE PROVIDED. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 724 942 4/1 20/1  
LAMONT-DOHERTY GEOLOGICAL OBSERVATORY PALISADES N Y

SOUND FROM APOLLO ROCKETS IN SPACE, (U)

OCT 70 7P COTTEN, DONALD ; DONN, WILLIAM  
L. ;

REPT. NO. LDGO-1618  
CONTRACT: DAAB07-69-C-0250, DAHCO4-67-C-0037  
PROJ: DA-2-0-061102-B-53-B  
MONITOR: AR0D 6997:10-EN

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN SCIENCE, V171 P565-567, 12  
FEB 71.

DESCRIPTORS: (\*MICROBAROMETRIC WAVES, MEASUREMENT),  
(\*MANNED SPACECRAFT, SONIC BOOM), SOUND TRANSMISSION,  
TURBULENCE, UPPER ATMOSPHERE, SUPERSONIC FLOW, KINETIC  
THEORY, LOW FREQUENCY, BERMUDA (U)  
IDENTIFIERS: APOLLO 12 SPACECRAFT, APOLLO, APOLLO 13  
SPACECRAFT, INFRASONICS, RADIATION (U)

LOW-FREQUENCY SOUND HAS BEEN RECORDED ON AT LEAST  
TWO OCCASIONS IN BERMUDA WITH THE PASSAGE OF  
APOLLO ROCKET VEHICLES 180 KILOMETERS ALOFT. THE  
SIGNALS, WHICH ARE REMINISCENT OF N-WAVES FROM  
SONIC BOOMS, ARE: HORIZONTALLY COHERENT; HAVE  
EXTREMELY HIGH (SUPERSONIC) TRACE VELOCITIES  
ACROSS THE TRIPARTITE ARRAYS; HAVE NEARLY IDENTICAL  
APPEARANCE AND FREQUENCIES; HAVE ESSENTIALLY  
IDENTICAL ARRIVAL TIMES AFTER ROCKET LAUNCH; ARE THE  
ONLY COHERENT SIGNALS RECORDED OVER MANY HOURS.  
THESE OBSERVATIONS SEEM TO ESTABLISH THAT THE  
RECORDED SOUND COMES FROM THE ROCKETS AT HIGH  
ELEVATION. DESPITE THIS HIGH ELEVATION, THE VALUES  
OF SURFACE PRESSURE APPEAR TO BE EXPLAINABLE ON THE  
BASIS OF A COMBINATION OF A KINETIC THEORY APPROACH  
TO SHOCK FORMATION IN RAREFIED ATMOSPHERE WITH  
ESTABLISHED GAS-DYNAMICS SHOCK THEORY. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 725 132 20/1  
NAVAL ORDNANCE LAB WHITE OAK MD

SONIC BOOMS IN THE SEA.

(U)

FEB 71 21P URICK, R. J. ;  
REPT. NO. NOLTR-71-30  
PROJ: NOL-IR-1

UNCLASSIFIED REPORT

DESCRIPTORS: (\*UNDERWATER SOUND, MEASUREMENT), (\*SONIC  
BOOM, UNDERWATER SOUND), JET FIGHTERS, SOUND  
TRANSMISSION, DEEP WATER, SURFACE TO UNDERWATER, NAVAL  
AIRCRAFT (U)

IDENTIFIERS: AIR WATER INTERACTIONS, MOST PROJECT-

2

(U)

SONIC BOOMS LAID DOWN BY NAVY FIGHTER AIRCRAFT  
FLYING AT MACH 1.1-1.2 HAVE BEEN OBSERVED BELOW THE  
SURFACE OF THE SEA BY MEANS OF A STRING OF  
HYDROPHONES 195 FEET LONG DANGLING FROM A SURFACE  
SHIP. THE UNDERWATER BOOMS WERE FOUND TO DECAY  
ABOUT AS THE  $-3/2$  POWER OF THE DEPTH BELOW THE  
SURFACE, TO HAVE THE SAME SPECTRAL CONTENT AS THE  
BOOM IN AIR, AND TO TRAVEL DOWN THE STRING WITH THE  
VELOCITY OF SOUND IN WATER. THESE FINDINGS  
CONTRADICT THE THEORY OF AN 'INHOMOGENEOUS' WAVE  
INCIDENT BEYOND THE CRITICAL ANGLE, AS ORIGINALLY  
STATED BY RAYLEIGH AND AS RECENTLY EXTENDED TO  
SONIC BOOMS BY SAWYERS AND COOK. THEY SUGGEST,  
INSTEAD, THAT THE UNDERWATER SONIC BOOM IS A WAVE  
SCATTERED BY THE ROUGH SEA SURFACE INTO THE SEA  
BELOW. ITS DECAY WITH DEPTH IS SO RAPID THAT IT IS  
NOT LIKELY TO BE PERCEPTIBLE AGAINST THE AMBIENT  
NOISE BACKGROUND AT DEPTHS GREATER THAN ONE OR TWO  
THOUSAND FEET IN THE DEEP SEA. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 725 185 20/1  
ROCHESTER UNIV N Y DEPT OF ELECTRICAL ENGINEERING

MEASUREMENTS OF THE REFRACTION AND DIFFRACTION  
OF A SHORT N WAVE BY A GAS-FILLED SOAP  
BUBBLE.

(U)

SEP 70 9P DAVY, BRUCE A. ; BLACKSTOCK,  
DAVID T. ;  
CONTRACT: F44620-69-C-0044  
PROJ: AF-9781  
TASK: 978102  
MONITOR: AFOSR TR-71-1670

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN THE JNL. OF THE ACOUSTICAL  
SOCIETY OF AMERICA, V49 N3 PT2 P732-737 MAR 71.

DESCRIPTORS: (\*SONIC BOOM, SPECTRUM SIGNATURES), (\*SOUND  
TRANSMISSION, BUBBLES), EXPERIMENTAL DESIGN, TEST  
EQUIPMENT, TEST METHODS, REFRACTION, DIFFRACTION,  
FOCUSING

(U)

IDENTIFIERS: WAVEFORMS

(U)

THE PRESSURE SIGNATURES OF SONIC BOOMS MEASURED IN  
THE FIELD OFTEN SHOW CONSIDERABLE VARIATIONS FROM THE  
IDEAL N WAVESHAPE. PEAKED AND ROUNDED VERSIONS OF  
THE N ARE COMMONLY OBSERVED. PIERCE HAS PROPOSED  
THAT PEAKING AND ROUNDING ARE THE RESULT OF  
REFRACTION AND DIFFRACTION CAUSED BY ATMOSPHERIC  
INHOMOGENEITIES. TO TEST THIS EXPLANATION, A MODEL  
EXPERIMENT HAS BEEN CARRIED OUT IN THE LABORATORY.  
N WAVES ABOUT 1 CM LONG WERE PRODUCED BY AN  
ELECTRIC SPARK, REFRACTED AND DIFFRACTED BY A GAS-  
FILLED SOAP BUBBLE, AND RECEIVED BY A VERY WIDE-RANGE  
CONDENSER MICROPHONE. THE MICROPHONE OUTPUT WAS  
DISPLAYED ON AN OSCILLOSCOPE. THE SPARK-MICROPHONE  
DISTANCE WAS HELD FIXED, AND MEASUREMENTS WERE TAKEN  
WITH THE BUBBLE AT VARIOUS POINTS IN BETWEEN. THE  
BUBBLE ACTED AS A CONVERGING ACOUSTIC LENS WHEN IT  
WAS FILLED WITH ARGON AND AS A DIVERGING LENS WHEN  
FILLED WITH HELIUM. IT WAS FOUND THAT THE  
CONVERGING LENS CAUSED PEAKING OF THE N WAVE, WHILE  
THE DIVERGING LENS CAUSED ROUNDING. THESE RESULTS  
QUALITATIVELY SUPPORT PIERCE'S THEORETICAL MODEL.  
THE DATA DO NOT SERVE AS A QUANTITATIVE TEST OF  
PIERCE'S SPECIFIC NUMERICAL EXAMPLES, HOWEVER,  
BECAUSE THE PARTICULAR CONDITIONS HE ASSUMED WERE NOT  
REPRODUCED IN OUR EXPERIMENT. A DISCUSSION IS GIVEN  
OF THE EFFECT OF SOME OF THESE CONDITIONS, SUCH AS  
THE ORDER AND RELATIVE TIME OF ARRIVAL OF THE  
REFRACTED AND DIFFRACTED WAVES, ON THE WAVEFORM.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 725 658 20/1  
DEUTSCHE FORSCHUNGS- UND VERSUCHSANSTALT FUER LUFT- UND  
RAUMFAHRT E V AACHEN (WEST GERMANY)

UEBERSCHALLKNALL UND WIDERSTAND EINES VORNE  
SPITZEN ROTATIONSKOERPERS IN EINER  
SCHEREGESCHICHTETEN ATMOSPHAERE (SONIC BOOM  
AND RESISTANCE OF A FORWARD BOW BOOM BODY  
IN A STRATIFIED ATMOSPHERE),

(U)

JUL 70 9P STUFF,ROLAND I  
REPT. NO. DFLR-SONDERDRUCK-97

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN ZEITSCHRIFT FUER  
ANGEWANDTE MATHEMATIK UND PHYSIK, V21 N6 P940-946  
1970. NO COPIES FURNISHED BY DDC OR NTIS.

SUPPLEMENTARY NOTE: TEXT IN GERMAN, ATTACHED SUMMARY IN  
ENGLISH.

DESCRIPTORS: (\*SONIC BOOM, AERODYNAMIC CONFIGURATIONS),  
DRAG, SHOCK WAVES, THICKNESS, WEST GERMANY (U)

J. L. RYHNING CONCLUDED THAT THE MINIMUM-BOOM  
BODY FOR GIVEN BOW-SHOCK WAVE DRAG AND MAXIMUM BODY  
THICKNESS IS ALSO THE MINIMUM DRAG BODY DUE TO THE  
BOW SHOCK FOR A GIVEN MAXIMUM BODY THICKNESS. IT IS  
SHOWN THAT THE ABOVE CONCLUSION IS ONLY VALID FOR  
ASYMPTOTIC DISTANCES. THE GEOMETRY OF THE MINIMUM-  
BOOM BODY DEPENDS ON THE DISTANCE FOR WHICH ONE WANTS  
TO MINIMIZE THE SONIC BOOM. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 725 865 20/1  
KALAMAZOO COLL MICH DEPT OF PHYSICS

STUDIES OF N WAVES FROM WEAK SPARKS IN  
AIR.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,  
JUN 71 63P WRIGHT, WAYNE M. ;  
CONTRACT: NONR-3932(00)  
PROJ: NR-384-321

UNCLASSIFIED REPORT

DESCRIPTORS: (\*ELECTRIC DISCHARGES, ACOUSTIC  
PROPERTIES), SOUND TRANSMISSION, GAS DISCHARGES, SHOCK  
WAVES, SONIC BOOM, TRANSIENTS (U)

THE REPORT SUMMARIZES WORK PERFORMED AT KALAMAZOO  
COLLEGE DURING THE PERIOD 1962-1970 ON THE STUDY OF  
ACOUSTIC TRANSIENTS IN AIR. THE MAJOR PORTION OF  
THIS RESEARCH WAS A MANY FACETED STUDY OF THE  
ACOUSTIC TRANSIENTS PRODUCED IN AIR BY WEAK SPARKS.  
THE SPARK ENERGIES WERE IN THE RANGE 0.0016 - 0.56  
J. AND THE ACOUSTIC WAVEFORMS RESEMBLED N WAVES  
WITH DURATIONS OF 10 - 40 MICROSECONDS AND AMPLITUDES  
OF THE ORDER OF 0.01 ATMOSPHERE. THESE WAVEFORMS  
WERE OBSERVED BY MEANS OF WIDE-BAND CONDENSER  
MICROPHONES. IT WAS POSSIBLE TO REPRODUCE A WEAK  
SHOCK WITH A RISE TIME AS SHORT AS 1/2 MICROSECONDS.  
TOPICS INVESTIGATED INCLUDE THE DEPENDENCE OF  
ACOUSTIC WAVEFORM UPON PROPAGATION DIRECTION, SPARK  
LENGTH, AND DISCHARGE ENERGY; THE DISTORTION OF THE  
WAVE PROFILE WITH PROPAGATION DISTANCE; AND THE  
DIFFRACTION AND SCATTERING OF N WAVES FROM  
RECTANGULAR PLATES, CIRCULAR DISCS, AND CYLINDRICAL  
RODS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 728 332 5/10 20/1  
STANFORD RESEARCH INST MENLO PARK CALIF

A STUDY OF SENSITIVITY TO NOISE.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,  
JUN 71 65P BECKER, R. W. ; POZA, F. ;  
KRYTER, K. D. ;  
CONTRACT: DOT-FA69WA-2211  
MONITOR: FAA-EQ 71-4

UNCLASSIFIED REPORT

DESCRIPTORS: (\*NOISE, SENSITIVITY), (\*PSYCHOPHYSIOLOGY,  
\*SONIC BOOM), AUDITORY PERCEPTION, PSYCHOACOUSTICS,  
REACTION(PSYCHOLOGY), PERSONALITY, ATTITUDES,  
SIMULATION, ANALYSIS OF VARIANCE (U)  
IDENTIFIERS: NOISE POLLUTION (U)

IN THE STUDY, 140 SUBJECTS WERE EXPOSED TO  
SIMULATED SONIC BOOMS AND RECORDED RESIDENTIAL NOISES  
IN ONE, TWO, OR THREE TWO-HOUR SESSIONS OVER A PERIOD  
OF SIX MONTHS. ELECTROPHYSIOLOGICAL MEASURES OF  
HEART RATE AND ELECTROMYOGRAPHIC RESPONSES TO THE  
STIMULI WERE ANALYZED. BIOGRAPHICAL,  
DEMOGRAPHICAL, AND PERSONALITY INVENTORIES WERE ALSO  
OBTAINED FOR EACH OF THE SUBJECTS. THE PURPOSE OF  
THIS RESEARCH WAS TO: DETERMINE WHETHER THERE ARE  
DIFFERENT DEGREES OF PSYCHOLOGICAL AND PHYSIOLOGICAL  
SENSITIVITY TO NOISE IN A LARGE GROUP OF PEOPLE; TO  
DETERMINE WHETHER AND HOW SUCH SENSITIVITY VARIED IN  
TIME; AND TO RELATE SUCH SENSITIVITY TO OTHER  
PSYCHOLOGICAL AND PERSONALITY VARIABLES.  
SIGNIFICANT DIFFERENCES IN PSYCHOLOGICAL  
SENSITIVITY TO NOISE WERE FOUND IN THE SUBJECT  
POPULATION. THESE DIFFERENCES REMAINED STABLE FOR  
THE DURATION OF THE EXPERIMENT AND WERE ALSO FOUND TO  
BE RELATED TO THE ATTITUDINAL AND BELIEF STRUCTURES  
OF THE INDIVIDUALS. DEFINITE PHYSIOLOGICAL  
RESPONSES TO THE SIMULATED SONIC BOOMS WERE OBSERVED.  
HOWEVER, THE PHYSIOLOGICAL INDICES USED IN THIS  
RESEARCH DID NOT SHOW INDIVIDUAL DIFFERENCES IN  
PHYSIOLOGICAL SENSITIVITY TO NOISE. THESE RESULTS  
DO NOT PRECLUDE THE POSSIBILITY THAT MORE ELABORATE  
AND EXTENSIVE PSYCHOPHYSIOLOGICAL MEASUREMENT MIGHT  
DEMONSTRATE VARYING PHYSIOLOGICAL SENSITIVITY TO  
NOISE. (AUTHOR) (U)



UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMD9

AD- 729 833 5/10 20/1  
CIVIL AEROMEDICAL INST OKLAHOMA CITY OKLA

THE EFFECTS OF SIMULATED SONIC BOOMS ON  
TRACKING PERFORMANCE AND AUTONOMIC RESPONSE, (U)

JUN 71 18P THACKRAY, RICHARD I. ;  
TOUCHSTONE, R. MARK ; JONES, KAREN N. ;  
PROJ: FAA-AM-A-71-PSY-21  
MONITOR: FAA-AM 71-29

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, \*REACTION(PSYCHOLOGY)),  
PERFORMANCE TESTS, RESPONSES, TRACKING, HEART, SKIN,  
PSYCHOPHYSIOLOGY, SIMULATION (U)  
IDENTIFIERS: OVERPRESSURE, HEART RATE (U)

SUBJECTS WERE EXPOSED TO FOUR SIMULATED 'INDOOR'  
SONIC BOOMS OVER AN APPROXIMATE THIRTY-MINUTE PERIOD.  
THE OVERPRESSURE LEVELS WERE 1.0, 2.0 AND 4.0 PSF  
(AS MEASURED 'OUTDOORS') WITH DURATIONS OF 295  
MILLISECONDS. SUBJECTS PERFORMED A TWO-DIMENSIONAL  
COMPENSATORY TRACKING TASK DURING THE EXPOSURE PERIOD  
AND CONTINUOUS RECORDINGS WERE OBTAINED OF HEART RATE  
AND SKIN CONDUCTANCE. NO EVIDENCE OF PERFORMANCE  
IMPAIRMENT WAS FOUND FOR ANY OF THE OVERPRESSURE  
LEVELS. RATHER, PERFORMANCE IMPROVED SIGNIFICANTLY  
FOLLOWING BOOM STIMULATION ALONG WITH HEART-RATE  
DECELERATION AND SKIN CONDUCTANCE INCREASE. THE  
OBTAINED PATTERN SUGGESTS THAT THE SIMULATED BOOMS  
MAY HAVE ELICITED MORE OF AN ORIENTING OR ALERTING  
RESPONSE THAN A STARTLE REFLEX. THE RESULTS ARE  
DISCUSSED IN TERMS OF THE POSSIBLE IMPORTANCE OF RISE  
TIME AS A DETERMINANT OF THE PHYSIOLOGICAL AND  
PERFORMANCE EFFECTS WHICH MAY BE PRODUCED BY SONIC  
BOOMS. SINCE FASTER RISE TIMES OF THE SIMULATED  
BOOMS MIGHT HAVE INCREASED LOUDNESS SUFFICIENTLY TO  
CHANGE THESE RESULTS CONSIDERABLY, CARE SHOULD BE  
TAKEN TO AVOID DRAWING UNWARRANTED CONCLUSIONS,  
RELATIVE TO GENERAL SONIC BOOM EFFECTS, ON THE BASIS  
OF THESE FINDINGS ALONE. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 732 679 13/2 6/6  
RAND CORP SANTA MONICA CALIF

FIFTY MORE TIMELY PROBLEMS OF THE  
ENVIRONMENT,

(U)

MAR 71 65P LIBBY, L. M. ;  
REPT. NO. P-4589

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO REPT. NO. P-4415 DATED  
SEP 70.

DESCRIPTORS: (\*ENVIRONMENT, PROBLEM SOLVING), (\*AIR  
POLLUTION, REVIEWS), (\*WATER POLLUTION, REVIEWS),  
CORRECTIONS, ECOLOGY, MINING ENGINEERING, ARSENIC,  
ANTARCTIC REGIONS, SONIC BOOM, AIRPORTS, FOG, ENZYMES,  
SEA ICE, MERCURY, FOOD, USSR, PUBLIC HEALTH, PETROLEUM  
INDUSTRY, VERMONT, ARCTIC REGIONS, INDIANA, HARBORS, NEW  
YORK, SANITARY ENGINEERING, REFINERIES, GEORGIA (U)  
IDENTIFIERS: WATER RECLAMATION, WEATHER MODIFICATION,  
NOISE POLLUTION, HOUSTON SHIP CHANNEL, SURFACE WATER  
RUNOFF, DETERGENTS (U)

THE ARTICLE INCLUDES VERY BRIEF REPORTS ON VARIOUS  
ENVIRONMENTAL TOPICS SOME OF THE TOPICS INCLUDE:  
EARTHQUAKE-RESISTANT BUILDING CONSTRUCTION, NOISE  
POLLUTION; ECOLOGICAL CHANGES CAUSED BY THE ASWAN  
DAM; MONITORING STARTUP OF NEW MINES AND  
SHUTDOWN OF OLD FURNACES; ARSENIC IN DETERGENTS AND  
IN RUN-OFF WATERS; DAMAGED FOOD VALUE OF VEGETABLE  
CROPS; ENZYMES IN DETERGENTS; ENVIRONMENTAL  
SAFETY IN HOUSTON SHIP CHANNEL; LIMITS OF  
HUMAN TOLERANCE FOR MERCURY CONTENT OF FOODS;  
SCALED COSTING OF WATER AS INCENTIVE FOR INDUSTRIAL  
REUSE; THERMAL POLLUTION OF LAKES AND RIVERS;  
SURVEY OF POLLUTION CONTROL BY INDUSTRY; OIL  
DISCOVERIES IN THE ARCTIC--OWNERSHIP; NEW CITY  
ON STATEN ISLAND; PNEUMATIC COLLECTION OF TRASH  
CITYWIDE; DEEP WELL WASTE DISPOSAL FOR WATER;  
STOL AIRPORTS FOR LARGE CITIES; SINKING LAND  
COMBATTED BY SOLID WASTE DISPOSAL; WATER POLLUTION  
BY FEED LOTS; RADIATION TREATMENT FOR SEWAGE; TAX  
INCENTIVES FOR COAL BURNERS. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 734 436 20/1 1/3  
GENERAL APPLIED SCIENCE LABS INC WESTBURY N Y

SONIC BOOM MINIMIZATION THROUGH AIR STREAM  
ALTERATION.

(U)

DESCRIPTIVE NOTE: FINAL REPT. MAR 70-JUL 71,  
JUL 71 138P LIPPERT, F. W. ;  
REPT. NO. GASL-TR-760  
CONTRACT: FA-70-WA-2320  
MONITOR: FAA-RD 71-90

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, REDUCTION), (\*SUPERSONIC  
PLANES, SONIC BOOM), SUPERSONIC CHARACTERISTICS,  
PRESSURE, COMBUSTION, BOUNDARY LAYER, INTERFERENCE,  
LIFT, JETS, LASERS  
IDENTIFIERS: SCAT 15F AIRCRAFT, SUPERSONIC TRANSPORT  
PLANES

(U)

(U)

THE POTENTIAL OF MODIFYING SUPERSONIC AIRCRAFT  
SONIC BOOM SIGNATURES BY MEANS OF ALTERING THE FLOW  
FIELD IN THE VICINITY OF THE AIRCRAFT WAS  
INVESTIGATED THEORETICALLY. A SPECIFIC AIRPLANE,  
THE NASA SCAT-15F, WAS SELECTED AS A BASIS, AND  
A CRUISE FLIGHT CONDITION OF MACH 2.7, 62,000 FEET  
WAS CHOSEN. SIGNATURES WERE COMPUTED USING REAL  
(1962) ATMOSPHERIC PROPERTIES. FINITE RISE  
TIMES, REDUCED OVERPRESSURES, AND REDUCED SHOCK  
PRESSURE RISES WERE AMONG THE SIGNATURE IMPROVEMENTS  
INVESTIGATED. FLOW FIELD ALTERATION MECHANISMS  
CONSIDERED INCLUDED FREE COMBUSTION, BOUNDARY LAYER  
MASS ADDITION, FORCE FIELDS, AND LASER-GENERATED HEAT  
FIELDS. FINALLY, THE CONCEPT OF A SEPARATE 'PENALTY  
AIRCRAFT' WAS PUT FORTH. THIS WOULD BE AN AIRCRAFT,  
PRESUMABLY CARRYING NO PAYLOAD, THAT WOULD FLY IN  
CLOSE PROXIMITY (SO THAT THE SONIC BOOMS  
INTERFERE) TO THE BASELINE AIRCRAFT AND RELIEVE THE  
NECESSITY OF INCREASING THE BASELINE AIRCRAFT GROSS  
WEIGHT BECAUSE OF SONIC BOOM ALLEVIATION SCHEMES.  
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 735 296 1/2 20/1  
BOEING CO RENTON WASH COMMERCIAL AIRPLANE GROUP

STUDY COVERING CALCULATIONS AND ANALYSIS OF  
SONIC BOOM DURING OPERATIONAL MANEUVERS.  
VOLUME I. ANALYSIS AND COMPUTATION OF  
MANEUVER EFFECTS. (U)

DESCRIPTIVE NOTE: FINAL REPT. APR 70-FEB 71.

FEB 71 311P  
REPT. NO. D6-A12108-1  
CONTRACT: DOT-FA70WA-2315  
MONITOR: FAA-EQ 71-2

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, MANEUVERABILITY),  
(\*SUPERSONIC PLANES, SONIC BOOM), PRESSURE, NUMERICAL  
ANALYSIS, STATISTICAL DATA (U)  
IDENTIFIERS: SCAT 15F AIRCRAFT, \*SUPERSONIC  
TRANSPORTS (U)

THE METHODS AND RESULTS OF THE STUDY OF THE EFFECTS  
OF OPERATIONAL SST MANEUVERS ON SONIC BOOM ARE  
CONTAINED IN THREE VOLUMES. VOLUME I SHOWS THAT  
THE THEORETICAL EFFECTS OF OPERATIONAL MANEUVERS DUE  
TO TYPICAL SST MANEUVERS ARE SMALL EXCEPT FOR  
MANEUVERS AT MACH NUMBERS BELOW ABOUT MACH 1.3.  
METHODS ARE OUTLINED FOR APPLYING THE RESULTS TO  
ANY AIRPLANE, AND SELECTED PRESSURE SIGNATURES ARE  
PRESENTED FOR THE U.S. SST AND SCAT 15-F.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 735 297 1/2 20/1  
BOEING CO RENTON WASH COMMERCIAL AIRPLANE GROUP

STUDY COVERING CALCULATIONS AND ANALYSIS OF  
SONIC BOOM DURING OPERATIONAL MANEUVERS.  
VOLUME III. DESCRIPTION OF COMPUTER  
PROGRAM 'SONIC BOOM PROPAGATION IN A  
STRATIFIED ATMOSPHERE' AND ESTIMATION OF  
LIMITATION NEAR CAUSTICS. (U)

DESCRIPTIVE NOTE: FINAL REPT. APR 70-FEB 71,  
FEB 71 294P HAGLUND, G. T. ; OLSON, D.

L. :

REPT. NO. D6A-12108-3  
CONTRACT: DOT-FA70WA-2315  
MONITOR: FAA-EQ 71-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 2, AD-735 390.

DESCRIPTORS: (\*SUPERSONIC PLANES, SONIC BOOM), COMPUTER  
PROGRAMS, PRESSURE, METEOROLOGICAL PARAMETERS (U)  
IDENTIFIERS: SCAT 15F AIRCRAFT, FORTRAN, FORTRAN 4  
PROGRAMMING LANGUAGE, \*SUPERSONIC TRANSPORTS (U)

THE METHODS AND RESULTS OF THE STUDY OF THE EFFECTS  
OF OPERATIONAL SST MANEUVERS ON SONIC BOOM ARE  
CONTAINED IN THREE VOLUMES. VOLUME III DESCRIBES  
THE COMPUTER PROGRAM, 'SONIC BOOM PROPAGATION  
IN A STRATIFIED ATMOSPHERE', WRITTEN IN FORTRAN  
IV FOR PROCESSING ON AN IBM 7090 OR CDC 6600 AND  
PLOTING ON A CALCOMP DIGITAL INCREMENTAL PLOTTER.  
IT PROVIDES THE CAPABILITY TO CALCULATE SONIC BOOM  
PRESSURE SIGNATURES GENERATED BY ARBITRARY  
MANEUVERING AIRPLANES IN HORIZONTALLY STRATIFIED  
ATMOSPHERES WITH WIND. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 735 390 1/2 20/1  
BOEING CO RENTON WASH COMMERCIAL AIRPLANE GROUP

STUDY COVERING CALCULATIONS AND ANALYSIS OF  
SONIC BOOM DURING OPERATIONAL MANEUVERS.  
VOLUME II. PRELIMINARY FLIGHT TEST  
PLAN. (U)

DESCRIPTIVE NOTE: FINAL REPT. APR-DEC 70,  
DEC 70 101P HAGLUND, GEORGE T. IKANE,  
EDWARD J. ;  
REPT. NO. D6A-12108-2  
CONTRACT: DDT-FA70WA-2315  
MONITOR: FAA-EQ 71-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME I, AD-735 296, AND  
VOLUME 3, AD-735 297.

DESCRIPTORS: (\*SUPERSONIC PLANES, \*SONIC BOOM), FLIGHT  
TESTING, ACCELERATION, LEVEL FLIGHT, MATHEMATICAL  
ANALYSIS (U)  
IDENTIFIERS: SCAT 15F AIRCRAFT, \*SUPERSONIC  
TRANSPORTS (U)

THE METHODS AND RESULTS OF THE STUDY OF THE EFFECTS  
OF OPERATIONAL SST MANEUVERS ON SONIC BOOM ARE  
CONTAINED IN THREE VOLUMES. VOLUME II CONTAINS A  
FLIGHT TEST PLAN DESIGNED TO INVESTIGATE CAUSTICS AT  
THE GROUND PRODUCED DURING LONGITUDINAL  
ACCELERATIONS, CIRCULAR TURNS, AND STEADY, LEVEL  
FLIGHT AT THE THRESHOLD MACH NUMBER. A FLIGHT  
TEST PLAN IS DEFINED FOR STUDYING SONIC BOOM  
PHENOMENA NEAR LATERAL CUT-OFF. CHARTS ARE  
PROVIDED TO BE USED IN THE FIELD IN DETERMINING THE  
REQUIRED AIRPLANE POSITION RELATIVE TO THE MEASURING  
NETWORKS AS A FUNCTION OF FLIGHT VARIABLES AND  
METEOROLOGICAL CONDITIONS. METHODS ARE GIVEN FOR  
CALCULATING CAUSTIC LOCATIONS DUE TO LONGITUDINAL  
ACCELERATIONS AND THE LATERAL CUT-OFF LOCATION DURING  
STEADY, LEVEL FLIGHT. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 738 790 21/5  
DEUTSCHE FORSCHUNGS- UND VERSUCHSANSTALT FUER LUFT- UND  
RAUMFAHRT E V BRUNSWICK (WEST GERMANY)

ZUR AUSLEGUNG UND BEMESSUNG EINES TRIEBWERKS  
MIT WAHLWEISE ZUSCHALTBAREN TRIEBWERKSKOMPONENTEN  
FUER DEN EINSATZ IN UEBERSCHALL-  
VERKEHRSFLUGZEUGEN (DESIGN AND PARAMETERS OF A  
POWER PLANT WITH OPTIONALLY SELECTIVE POWER  
COMPONENTS FOR SUPERSONIC AIRLINERS), (U)

AUG 70 12P VON BONIN, LUTZ :  
REPT. NO. DFVLR-SONDERDRUCK-169

UNCLASSIFIED REPORT  
AVAILABILITY: PUB. IN ZEITSCHRIFT FUER  
FLUGWISSENSCHAFTEN V19 N11 P437-448 1971. NO COPIES  
FURNISHED BY DDC OR NTIS.  
SUPPLEMENTARY NOTE: TEXT IN GERMAN. SUMMARY IN  
ENGLISH AND FRENCH.

DESCRIPTORS: (•AIRCRAFT ENGINES, EXPERIMENTAL DESIGN),  
SUPERSONIC AIRCRAFT, SUBSONIC CHARACTERISTICS, HIGH  
ALTITUDE, SUPERSONIC CHARACTERISTICS, MATHEMATICAL  
MODELS, PAYLOAD, FEASIBILITY STUDIES (U)

THE SUBJECT OF THE STUDY IS THE PROPOSAL FOR A TWIN  
SPOOL POWER PLANT WITH HIGH PRESSURE CUT OFF FOR  
OPERATION IN SUPERSONIC AIRLINERS (MACH NUMBER 3)  
WHICH HAVE TO PASS A LARGER FLIGHT SECTION IN THE  
SUBSONIC RANGE REACHING BEYOND THE CLIMB AND  
ACCELERATION PHASE WITH REGARD TO THE SUPERSONIC  
BOOM. THIS PROPOSAL IS BASED ON CONSTRUCTING AN  
ENGINE FOR THE TWO EXTREMELY DIFFERING FLIGHT  
CONDITIONS - SUPERSONIC FLIGHT WITH MACH NUMBER 3  
IN AN ALTITUDE OF 20 KM AND SUBSONIC FLIGHT WITH  
MACH NUMBER 0.9 IN AN ALTITUDE OF 11 KM - THAT IS  
OPTIMALLY DESIGNED AND SIZED FOR BOTH FLIGHT PHASES.  
AFTER A BRIEF DISCUSSION OF THE STRUCTURE AND  
METHOD OF OPERATION OF SUCH AN ENGINE, THE SYSTEM OF  
EQUATIONS FOR THE DETERMINATION OF THE PAYLOAD  
RELATED TO THE STARTING WEIGHT IS DEVELOPED WITH SOME  
SIMPLIFYING ASSUMPTIONS IN ORDER TO BE ABLE TO  
INVESTIGATE THE EFFECT OF SUCH AN ENGINE CONCEPT ON  
THE PROFITABILITY OF THE AIRCRAFT WITHIN A FIRST  
ONSET. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 740 697 5/10 20/1  
TRACOR INC AUSTIN TEX

ENVIRONMENTAL INFLUENCE ON PUBLIC RESPONSE TO  
THE SONIC BOOM. (U)

DESCRIPTIVE NOTE: FINAL REPT.

72 47P  
CONTRACT: DOT-FA70WA-2254  
PROJ: FAA-253-011  
MONITOR: FAA-NO 70-17

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, \*ATTITUDES(PSYCHOLOGY)),  
(\*PUBLIC OPINION, \*SONIC BOOM), JET PLANE NOISE,  
AIRPORTS, URBAN AREAS, NOISE, VEHICLES, TRANSPORTATION(U)  
IDENTIFIERS: \*NOISE EXPOSURE, \*NOISE POLLUTION,  
COMMUNITIES (U)

PREVIOUS STUDIES OF PUBLIC RESPONSE TO THE SONIC  
BOOM HAVE NOT CONSIDERED REACTIONS TO THE BOOM WITHIN  
THE CONTEXT OF THE CITY OR NEIGHBORHOOD ENVIRONMENT.  
DATA CONCERNING COMMUNITY REACTION TO AIRPORT NOISE  
IN ORDER TO STUDY THE EFFECT OF ENVIRONMENT  
CONDITIONS, BOTH PHYSICAL AND SOCIAL, ON RESPONSE TO  
THE BOOM. ATTITUDINAL RESPONSE IS AFFECTED BY THE  
RESPONDENT'S ENVIRONMENT. (AUTHOR) (U)



UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 740 897 20/1  
TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES

THE EFFECTS OF WIND AND TEMPERATURE  
GRADIENTS ON SONIC BOOM CORRIDORS.

(U)

DESCRIPTIVE NOTE: TECHNICAL NOTE,  
OCT 71 39P ONYEONWU, R. O. I  
REPT. NO. UTIAS-TN-168  
CONTRACT: AF-AFOSR-1885-70  
PROJ: AF-9781  
TASK: 978102  
MONITOR: AFOSR TR-71-3087

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, EQUATIONS OF MOTION),  
DIFFERENTIAL EQUATIONS, VECTOR ANALYSIS, CURVE FITTING,  
FLIGHT PATHS, MATHEMATICAL MODELS, SUPERSONIC FLIGHT,  
ATMOSPHERIC TEMPERATURE, WIND, CANADA (U)

CALCULATION OF SONIC BOOM CORRIDOR WIDTHS BASED ON  
CLOSED FORM SOLUTIONS OF RAY ACOUSTIC EQUATIONS USING  
PIECEWISE LINEAR ATMOSPHERIC MODELS OF WINDS AND  
TEMPERATURES HAS BEEN ACCOMPLISHED. DETAILED  
SOLUTIONS OF RAY TRACING EQUATIONS ARE PRESENTED FOR  
ALL POSSIBLE VARIATIONS OF WINDS AND TEMPERATURES,  
WITHIN THE FRAMEWORK OF THE ASSUMED MODEL ATMOSPHERE.  
THE EFFECTS OF AIRCRAFT FLIGHT ALTITUDE AND MACH  
NUMBER, WIND AND TEMPERATURE GRADIENTS, AND WIND  
DIRECTION ON SONIC BOOM CORRIDOR ARE INVESTIGATED IN  
DETAIL, INCLUDING THE EFFECTS OF NON-STANDARD  
ATMOSPHERES SUCH AS PREVAIL IN WINTER MONTHS.  
NUMERICAL RESULTS ARE PRESENTED AND AMPLY  
DISCUSSED. AGREEMENT OF THE PRESENT CALCULATIONS  
WITH PUBLISHED DATA IS EXCELLENT. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 741 852 13/13  
WIGGINS (J H) CO PALOS VERDES ESTATES CALIF

SONIC BOOM AND NATURAL DETERIORATION  
EFFECTS ON BUILDINGS - WHITE SANDS  
STRUCTURE RESURVEY.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,  
FEB 72 51P WIGGINS, J. H. , JR;  
MONITOR: FAA-RD 72-25

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, \*BUILDINGS), DEGRADATION,  
CRACKS, DAMAGE ASSESSMENT, NEW MEXICO  
IDENTIFIERS: WEATHERING

(U)

(U)

THE PURPOSE OF THE STUDY WAS TO EVALUATE THE  
CURRENT STATE OF NATURAL DETERIORATION OF THE  
STRUCTURES USED FOR SONIC BOOM TESTING PURPOSES BY  
THE FAA AND TO COMPARE THAT STATE WITH THE DAMAGES  
CAUSED BY THE 1494 SONIC BOOMS GENERATED DURING THE  
TESTS. STRUCTURAL RESPONSE TESTS WERE CONDUCTED  
UNDER SONIC BOOMS RANGING IN INTENSITY FROM 1.5 PSF.  
TO 38 PSF. SINCE THE TESTING PROGRAM, SEVEN YEARS  
OF NATURAL FORCES RESULTING FROM SUN, WIND, MOISTURE  
AND SOIL MOVEMENTS HAVE TAKEN PLACE. IT WAS OF  
GREAT INTEREST, THEREFORE, TO REEAXAMINE THESE  
STRUCTURES SOME SEVEN YEARS LATER AND DETERMINE THE  
AMOUNT OF NATURALLY OCCURRING CUMULATIVE DAMAGE THAT  
HAS TAKEN PLACE OVER THE YEARS. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 745 728 20/1 4/1  
NAVAL ORDNANCE LAB WHITE OAK MD

PROPAGATION OF A WEAK SHOCK WAVE THROUGH A  
TURBULENT MEDIUM,

(U)

MAY 72 26P PHINNEY, RALPH E. ; TAYLOR,  
LEONARD S. ;  
REPT. NO. NOLTR-72-130  
PROJ: NOL-324/FAA

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, DISTORTION), (\*ATMOSPHERIC  
MOTION, MICROBAROMETRIC WAVES), PROPAGATION, PARTIAL  
DIFFERENTIAL EQUATIONS, VECTOR ANALYSIS, TURBULENCE,  
SHOCK WAVES

(U)

THE PROPAGATION OF A WEAK NEARLY PLANE SHOCK WAVE  
THROUGH A SLIGHTLY INHOMOGENEOUS MEDIUM WAS STUDIED.  
THE EQUATIONS FOR A FINITE STRENGTH SHOCK WAVE ARE  
USED AS A STARTING POINT IN ORDER THAT THE CUMULATIVE  
EFFECT OF SECOND ORDER TERMS WILL NOT BE LOST. THE  
MOTIVATION FOR THE STUDY WAS THE EXPERIMENTAL  
OBSERVATION THAT ATMOSPHERIC TURBULENCE CAN  
ALTERNATELY FOCUS AND DEFOCUS WEAK WAVES FROM AN  
AIRCRAFT. A MORE DETAILED UNDERSTANDING OF THE  
INFLUENCE OF ATMOSPHERIC TURBULENCE ON THIS PROBLEM  
WAS SOUGHT. THE BASIC EQUATIONS ARE DERIVED, AND  
SOME PRELIMINARY RESULTS ARE OBTAINED. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 747 989 5/10  
CIVIL AEROMEDICAL INST OKLAHOMA CITY OKLA

RESIDUAL PERFORMANCE EFFECTS OF SIMULATED  
SONIC BOOMS INTRODUCED DURING SLEEP, (U)

MAY 72 12P CHILES, W. DEAN (WEST,  
GEORGETTA ;  
MONITOR: FAA-AM 72-19

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SLEEP, \*SONIC BOOM),  
(\*STRESS(PSYCHOLOGY), SONIC BOOM), PERFORMANCE(HUMAN),  
MALES, SIMULATION, AGING(PHYSIOLOGY), DIURNAL  
VARIATIONS, PSYCHOACOUSTICS (U)

TWENTY-FOUR MALE SUBJECTS WERE TESTED ON A COMPLEX PERFORMANCE DEVICE INVOLVING MONITORING, MENTAL ARITHMETIC, AND PATTERN DISCRIMINATION. THREE AGE-GROUPS WERE USED: 20 TO 26, 40 TO 45, AND 60 TO 72. SUBJECTS WERE TESTED FOR 30 MINUTES EACH MORNING AND EACH EVENING FOR A 21-DAY PERIOD. ON THE SIXTH THROUGH THE 17TH NIGHTS, SUBJECTS WERE EXPOSED TO EIGHT SIMULATED SONIC BOOMS WITH AN 'OUTDOORS' OVERPRESSURE LEVEL OF 1.0 PSF PRESENTED AT 1-HOUR INTERVALS DURING SLEEP. THE RESULTS PROVIDED NO EVIDENCE THAT EXPOSURE TO SIMULATED SONIC BOOMS DURING SLEEP PRODUCED MEASURABLE CONSEQUENCES WITH RESPECT TO COMPLEX PERFORMANCE. A SIGNIFICANT AGE EFFECT WAS FOUND FOR FIVE OF THE TEN MEASURES. SIGNIFICANT DIFFERENCES (APPARENTLY A LEARNING EFFECT) WERE FOUND IN PERFORMANCE ACROSS THE THREE PHASES (PRE-BOOM, BOOM, AND POST-BOOM). THERE WAS ALSO A SIGNIFICANT INTERACTION BETWEEN AGE AND PHASE FOR FIVE OF THE MEASURES. (AUTHOR) (U)

UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 748 055 5/10 20/1  
AEROSPACE MEDICAL RESEARCH LAB WRIGHT-PATTERSON AFB  
OHIO

HUMAN RESPONSE TO SONIC BOOM IN THE  
LABORATORY AND THE COMMUNITY,

(U)

JAN 71 18P GIERKE, H. E. VON NIXON, C.  
W. ;  
REPT. NO. AMRL-TR-69-47  
PROJ: AF-7231

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN THE JNL. OF THE ACOUSTICAL  
SOCIETY OF AMERICA, V51 N2 P766-782 1972.  
SUPPLEMENTARY NOTE: REVISION OF REPORT DATED 3 NOV  
70.

DESCRIPTORS: (\*SONIC BOOM, REACTION(PSYCHOLOGY)),  
PSYCHOACOUSTICS, ATTITUDES(PSYCHOLOGY), SUPERSONIC  
AIRCRAFT, TRANSPORT AIRCRAFT, INTENSITY (U)  
IDENTIFIERS: \*NOISE POLLUTION, OVERPRESSURE (U)

PRESENT-DAY ESTIMATES REGARDING THE ACCEPTABILITY  
OF SONIC BOOMS BY MAN ARE DERIVED FROM VARIOUS  
OBSERVATIONS, OVERFLIGHT PROGRAMS, AND EXPERIMENTAL  
FIELD AND LABORATORY STUDIES CONDUCTED BOTH WITHIN  
AND OUTSIDE THE UNITED STATES. THE LOUDNESS AND  
ANNOYANCE OF INDIVIDUAL BOOMS AND THEIR DEPENDENCE ON  
THE BOOM OVERPRESSURE AND PRESSURE-TIME FUNCTION AS  
WELL AS THE COMPLEX REACTION OF INDIVIDUALS, GROUPS,  
AND COMMUNITIES EXPOSED TO SONIC BOOMS OF VARIED  
MAGNITUDE AND FREQUENCY ARE DISCUSSED. THE FEW  
EXPERIMENTS AVAILABLE PROVING THAT EVEN SONIC BOOMS  
OF THE MAXIMUM INTENSITY PRESENTLY FEASIBLE DO NOT  
PRODUCE DIRECT MEDICAL INJURY ARE DESCRIBED. BASED  
ON THE INTEGRATED BODY OF RESULTS OF RECENT  
PHYSIOLOGICAL, PSYCHOACOUSTIC, BEHAVIORAL, AND  
SOCIOLOGICAL STUDIES IN VARIOUS COUNTRIES, ESTIMATES  
OF THE EFFECTS AND ACCEPTABILITY OF REGULAR, FREQUENT  
SUPERSONIC COMMERCIAL OVERLAND FLIGHT SCHEDULES ARE  
PRESENTED AND DISCUSSED IN TERMS OF AIRCRAFT NOISE  
POLLUTION IN GENERAL, AND OF POTENTIAL CERTIFICATION  
OF AIRCRAFT WITH RESPECT TO NOISE AND SONIC BOOM.  
FINDINGS SUPPORT THE CURRENT POLICY THAT COMMERCIAL  
SUPERSONIC TRANSPORT AIRCRAFT WILL NOT BE PERMITTED  
TO FLY OVER THE UNITED STATES UNLESS AND UNTIL  
THE NOISE FACTORS ARE BROUGHT WITHIN ACCEPTABLE  
LIMITS. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 749 277 6/19  
CIVIL AEROMEDICAL INST OKLAHOMA CITY OKLA

SONIC BOOMS AND SLEEP: AFFECT CHANGE AS A  
FUNCTION OF AGE, (U)

JUN 72 15P SMITH, ROGER C. HUTTO, GARY  
L. I  
MONITOR: FAA-AM 72-24

UNCLASSIFIED REPORT

DESCRIPTORS: (SLEEP, \*SONIC BOOM), BEHAVIOR,  
STRESS(PHYSIOLOGY), AGING(PHYSIOLOGY),  
FATIGUE(PHYSIOLOGY), STRESS(PSYCHOLOGY) (U)

THE STUDY CONCERNED THE MEASUREMENT OF MOOD CHANGES  
RESULTING FROM SIMULATED SONIC BOOMS OCCURRING DURING  
SLEEP. SUBJECTS FROM THREE AGE GROUPS (21 TO 26,  
40 TO 45, AND 60 TO 72 YEARS OLD) SPENT 21  
CONSECUTIVE NIGHTS IN A SLEEPING ROOM EQUIPPED FOR  
SONIC-BOOM SIMULATION. DURING THE SIXTH THROUGH  
SEVENTEENTH NIGHTS, SIMULATED SONIC BOOMS OF 1.0 PSF  
'OUTDOORS' OVERPRESSURE LEVEL (1.1 PSF MEASURED  
INSIDE THE THE SLEEPING ROOMS) WERE PRESENTED  
HOURLY THROUGHOUT EACH NIGHT. AS THE MEASURE OF  
MOOD, THE SUBJECTS COMPLETED A COMPOSITE MOOD  
ADJECTIVE CHECKLIST IN THE EVENING BEFORE RETIRING  
AND IN THE MORNING AFTER WAKING ON EACH OF THE 21  
DAYS. NO CHANGE IN MOODS ATTRIBUTABLE TO THE  
OCCURRENCE OF SIMULATED SONIC BOOMS WAS FOUND.  
SUBSTANTIAL EFFECTS RELATING TO THE AGE OF  
SUBJECTS, IRRESPECTIVE OF BOOM PRESENTATIONS, WERE  
OBTAINED. IT WAS CONCLUDED THAT SIMULATED SONIC  
BOOMS OF SUCH LOW INTENSITY WERE UNLIKELY TO HAVE  
ADVERSE CONSEQUENCES ON THE MOOD STATES OF MOST  
INDIVIDUALS. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 751 931 2/5 6/19 20/1  
AGRICULTURAL RESEARCH SERVICE BELTSVILLE MD

AN INTERDISCIPLINARY STUDY OF THE EFFECTS OF  
REAL AND SIMULATED SONIC BOOMS ON FARM-  
RAISED MINK (MUSTELA VISION).

(U)

DESCRIPTIVE NOTE: FINAL REPT.,

AUG 72 242P TRAVIS, HUGH F. ; BOND, JAMES  
; WILSON, R. L. ; LEEKLEY, J. R. ; MENEAR, J.  
R. ;

CONTRACT: DOT-FA70WAI-171

MONITOR: FAA-EQ 72-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH  
WASHINGTON STATE UNIV., SEATTLE, ALASKA UNIV.,  
COLLEGE, AND THE DEPARTMENT OF THE AIR FORCE,  
WASHINGTON, D. C.

DESCRIPTORS: (\*RODENTS, SONIC BOOM), (\*SONIC BOOM,  
STRESS(PHYSIOLOGY)), NOISE, ANIMALS, BEHAVIOR,  
REPRODUCTION(PHYSIOLOGY), INFECTIOUS DISEASES,  
PATHOLOGY

(U)

IDENTIFIERS: \*NOISE POLLUTION, ANIMALS, BEHAVIOR,  
DOMESTIC ANIMALS

(U)

STUDIES WERE CONDUCTED AT THREE SITES ON MITKOF  
ISLAND, ALASKA, TO DETERMINE THE EFFECTS OF THREE  
REAL OR THREE SIMULATED SONIC BOOMS OF ABOUT 6 POUNDS  
PER SQUARE FOOT OVER-PRESSURE UPON REPRODUCTION IN  
FARM-RAISED MINK. CONTROL ANIMALS WERE NOT BOOMED.  
NO DIFFERENCES ( $P > .05$ ) WERE FOUND AMONG  
EXPERIMENTAL TREATMENTS FOR LENGTH OF GESTATION,  
NUMBER OF KITS BORN PER FEMALE WHELPING, NUMBER OF  
KITS ALIVE PER FEMALE AT 5 AND 10 DAYS OF AGE, WEIGHT  
OF KITS AT 49 DAYS OF AGE, KIT PELT VALUE AND SELLING  
PRICE. A BEHAVIORAL STUDY SHOWED NO EVIDENCE THAT  
THE FEMALE MINK UNDER OBSERVATION WERE SUFFICIENTLY  
DISTURBED BY SONIC BOOMS. RESULTS OF NECROPSY  
EXAMINATIONS SHOWED NO MINK DEATHS ATTRIBUTABLE TO  
REAL OR SIMULATED SONIC BOOMS. LIKEWISE, NO  
EVIDENCE WAS FOUND THAT BACTERIAL DISEASE WAS INDUCED  
IN THE HERD FOLLOWING EXPOSURE TO SONIC BOOMS. THE  
CONCLUSION DRAWN FROM THESE STUDIES IS THAT EXPOSURE  
OF FARM-RAISED MINK TO INTENSE SONIC BOOMS DURING  
WHELPING SEASON HAD NO ADVERSE AFFECT ON THEIR  
REPRODUCTION OR BEHAVIOR. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY    SEARCH CONTROL NO. /ZOM09

AD- 751 934            20/1            13/13  
BLUME (JOHN A) AND ASSOCIATES SAN FRANCISCO CALIF RESEARCH  
DIV

ADDITIONAL SONIC BOOM DATA RELATED TO  
TESTS CONDUCTED AT WHITE SANDS, NEW  
MEXICO, AND EDWARDS AIR FORCE BASE.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,  
SEP 72    19P    LEE, LLOYD A. ;  
MONITOR: FAA-RD    72-114

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, STRESSES), (\*STRUCTURAL  
MEMBERS, SONIC BOOM), STRAIN GAGES, STATISTICAL DATA (U)  
IDENTIFIERS: \*WINDOWS, OVERPRESSURE (U)

DATA IN THE FORM OF NOTES AND RECORDING WHICH WERE  
COMPILED DURING THE WHITE SANDS AND EDWARDS  
AIR FORCE BASE SONIC BOOM TEST PROGRAMS  
AND WHICH ARE PRESENTLY AVAILABLE IN FILES AT THE  
BLUME OFFICES WERE REVIEWED TO PRESENT WINDOW  
MOUNTED STRAIN GAGE READINGS WITH RELATED  
OVERPRESSURES DURING THE 1965 WHITE SANDS TESTS  
AND WINDOW SIZES OF THE EDWARDS AFB 1966 TEST  
STRUCTURES. THESE DATA ARE TO BE USED BY FAA IN  
CURRENT STUDIES. (AUTHOR)

(U)



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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 751 935 13/13 20/1  
NEW YORK UNIV BRONX DEPT OF AERONAUTICS AND  
ASTRONAUTICS

NUMERICAL PREDICTION OF INTERIOR AND  
STRUCTURAL RESPONSE OF BUILDINGS TO SONIC  
BOOM OVERFLIGHTS.

(U)

DESCRIPTIVE NOTE: FINAL REPT. MAR 71-SEP 72,  
SEP 72 55P SLUTSKY, SIMON ; ARNOLD, LEE ;  
REPT. NO. NYU-AA-72-23  
CONTRACT: DOT-FA71WA-2559  
MONITOR: FAA-RD 72-116

UNCLASSIFIED REPORT

DESCRIPTORS: (\*BUILDINGS, RESPONSE), (\*SUPERSONIC  
FLIGHT, \*SONIC BOOM), STRUCTURAL MEMBERS, FLOORS, ROOFS,  
ACOUSTIC PROPERTIES, MODELS(SIMULATIONS), SUPERSONIC  
AIRCRAFT, NUMERICAL ANALYSIS

(U)

THE REPORT DESCRIBES A PROCEDURE FOR PREDICTING THE  
STRUCTURAL AND ACOUSTIC RESPONSE OF FULL SCALE  
ARCHITECTURAL STRUCTURES TO SONIC BOOMS USING  
LABORATORY TECHNIQUES. IT IS SHOWN THAT THE  
ESSENTIAL ACOUSTIC PROPERTIES OF A FULL SCALE  
STRUCTURE LOCATED IN ISTRES, FRANCE COULD BE  
ACCURATELY SIMULATED ON A SMALL SCALE (1:20)  
MODEL LOCATED AT N.Y.U. AND THAT THIS MODEL  
COULD BE USED TO DETERMINE ACOUSTIC IMPULSE RESPONSE  
FUNCTIONS OF VARIOUS ROOMS UNDER VARYING WINDOW AND  
DOOR CONFIGURATIONS AND UNDER VARYING SUPERSONIC  
FLIGHT MACH NUMBERS. THE CALCULATED IMPULSE  
RESPONSE FUNCTIONS WERE USED IN CONJUNCTION WITH  
MEASURED SONIC BOOM SIGNATURES FROM MIRAGE III  
OVERFLIGHTS AT SPEEDS OF MACH 1 AND MACH 2 TO  
CALCULATE BUILDING RESPONSES. THESE RESPONSES WERE  
THEN COMPARED WITH MEASURED BUILDING RESPONSES.  
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 752 294 20/4 20/1  
DEUTSCHE FORSCHUNGS- UND VERSUCHSANSTALT FUER LUFT- UND  
RAUMFAHRT E V AACHEN (WEST GERMANY)

THE WAVE FORMATION AND SONIC BOOM DUE TO  
A DELTA WING,

(U)

MAR 71 24P OSWATITSCH, K. ; SUN, Y. C. ;  
REPT. NO. DFVLR-SONDERDRUCK-205

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN THE AERONAUTICAL  
QUARTERLY, V23 P87-108 MAY 72.

DESCRIPTORS: (\*DELTA WINGS, SHOCK WAVES), (\*SONIC BOOM,  
DELTA WINGS), PREDICTIONS, THREE DIMENSIONAL FLOW, FLOW  
FIELDS, TRAILING EDGE, LEADING EDGES, WEST GERMANY (U)

BY EMPLOYMENT OF THE ANALYTICAL METHOD OF  
CHARACTERISTICS AND OF A LIMITING PROCEDURE SUITABLE  
FOR DEALING WITH THE TRAILING EDGE EXPANSION, THE  
INFLUENCE OF NEAR-FIELD FLOW ON THE FAR-FIELD WAVE  
FORMATION HAS BEEN INVESTIGATED FOR AN INCIDENT FLAT  
DELTA WING WITH SUPERSONIC LEADING EDGES. THROUGH  
CONFINED IN ITS SCOPE TO THE FRONT SHOCK IN THE  
VERTICAL PLANE OF SYMMETRY OF THE WING AND TO A  
HOMOGENEOUS ATMOSPHERE WITHOUT DENSITY AND  
TEMPERATURE GRADIENTS, THE PRESENT ANALYSIS REVEALS  
FEATURES OF FLOW WHICH ARE INTERESTING FROM THE  
STANDPOINT OF THE GENERAL THEORY OF THREE-DIMENSIONAL  
SUPERSONIC FLOW. IT IS FOUND THAT THE FRONT SHOCK  
DUE TO A DELTA WING WILL AS A RULE BE CANCELLED AT A  
FINITE DISTANCE FROM THE WING BY THE PLANE-WAVE  
EXPANSION EMANATING FROM THE TRAILING EDGE. THE  
OVER-EXPANSION MUST THEN GIVE RISE TO A REAR SHOCK  
SEPARATE FROM THE FRONT ONE. THUS, AT LEAST IN THE  
PLANE OF SYMMETRY, A SHARP-FRONT WAVE SIGNATURE CAN  
NOT, IN GENERAL, BE EXPECTED FROM THE WING AT A  
DISTANCE BEYOND THE TERMINATING POINT OF THE FRONT  
SHOCK. THE BOOM SIGNATURE THEN WILL BE  
QUALITATIVELY DIFFERENT FROM THAT OF A BODY OF  
REVOLUTION. THE GENERAL NON-EQUIVALENCE OF A WING  
TO A BODY OF REVOLUTION IN THIS RESPECT SHOULD EVOKE  
SOME RETHINKING ABOUT SONIC BOOM PREDICTION AND  
ALLEVIATION. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 752 472 20/1 20/4  
NAVAL ORDNANCE LAB WHITE OAK MD

DISTORTION OF NEAR-SONIC SHOCKS BY WEAKLY  
TURBULENT LAYERS, (U)

SEP 72 25P TAYLOR, LEONARD S. ; PHINNEY,  
RALPH E. ;  
REPT. NO. NOLTR-72-225  
PROJ: NOL-324/FAA

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, SHOCK WAVES), TURBULENCE,  
FOCUSING, ATMOSPHERIC MOTION, NONLINEAR DIFFERENTIAL  
EQUATIONS, PARTIAL DIFFERENTIAL EQUATIONS (U)

THE FOCUSING EFFECTS OF TURBULENCE IN THE  
PROPAGATION MEDIUM UPON NEAR-SONIC SHOCKS ARE STUDIED  
BY EXTENDING THE THEORY OF SHOCK DYNAMICS TO A MEDIUM  
WITH RANDOM TEMPERATURE AND PRESSURE VARIATIONS. A  
PERTURBATION PROCEDURE IS USED TO SOLVE AND RESULTING  
NONLINEAR PARTIAL DIFFERENTIAL EQUATION. THE  
RESULTS ARE APPLIED IN A DISCUSSION OF SONIC BOOM  
DISTORTION IN THE TERRESTRIAL BOUNDARY LAYER.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 752 658 4/1 22/2  
LAMONT-DOHERTY GEOLOGICAL OBSERVATORY PALISADES N Y

ON THE GENERATION AND PROPAGATION OF SHOCK  
WAVES FROM APOLLO ROCKETS AT ORBITAL  
ALTITUDES. (U)

JUL 71 14P COTTEN, DONALD E. ; DONN,  
WILLIAM L. ; OPPENHEIM, ALAN ;  
REPT. NO. LDGO-1738  
CONTRACT: DAAB07-69-C-0250, DA-ARO-D-31-124-71-  
G90  
PROJ: DA-2-0-061102-8-53-8  
MONITOR: AROD 6997:21-EN

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN GEOPHYSICAL JNL. OF THE  
ROYAL ASTRONOMICAL SOCIETY, V26 P149-159 1971.  
SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH CITY  
UNIV. OF NEW YORK. SPONSORED IN PART BY GRANT  
NSF-GA-17454.

DESCRIPTORS: (\*MANNED SPACECRAFT, MICROBAROMETRIC  
WAVES), (\*LAUNCH VEHICLES, \*SHOCK WAVES), UPPER  
ATMOSPHERE, SONIC BOOM, ATTENUATION (U)  
IDENTIFIERS: APOLLO 12 SPACECRAFT, APOLLO 13  
SPACECRAFT, INFRASONICS, RADIATION (U)

ACOUSTIC SIGNALS FROM APOLLO ROCKETS AT ORBITAL  
ALTITUDE (188 KM) APPEAR TO BE EXPLAINABLE WITH  
THE ASSUMPTION THAT THE EXHAUST PLUME SERVES AS A  
CONICAL BODY OF LARGE CROSS-SECTION MOVING  
SUPERSONICALLY WITH THE ROCKET. THE PRESENCE OF  
THE SURFACE SIGNAL (1.3 HZ AND HIGHER) IMPLIES  
THAT PROPAGATION IN THE UPPER ATMOSPHERE OCCURRED AS  
AN N-WAVE SHOCK CONE WITHOUT THE STRONG ATTENUATION  
TO WHICH AN ACOUSTIC WAVE OR EVEN A SAW-TOOTHED  
(SHOCKED) WAVE OF SIMILAR FREQUENCY WOULD BE  
SUBJECTED. THE SHOCK CONE DOES NOT ATTENUATE  
BECAUSE ENERGY IS CONTINUALLY RESUPPLIED ALONG THE  
SHOCK CONE FROM THE VEHICLE AND ITS PLUME ACTING AS A  
PISTON. CALCULATED OVERPRESSURES DO NOT REDUCE TO  
ACOUSTIC AMPLITUDES UNTIL THE WAVE IS BELOW 40KM  
WHERE ACOUSTIC ATTENUATION BECOMES NEGLIGIBLE.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 752 881 20/1  
ACOUSTICAL SOCIETY OF AMERICA NEW YORK

PROCEEDINGS OF THE SONIC BOOM SYMPOSIUM  
(2ND) SPONSORED BY THE ACOUSTICAL SOCIETY OF  
AMERICA (80TH MEETING) HELD AT HOUSTON,  
TEXAS ON 3 NOVEMBER 1970, (U)

72 152P RIBNER, HERBERT S. ; HUBBARD,  
HARVEY H. I

UNCLASSIFIED REPORT

AVAILABILITY: AVAILABLE FROM BACK-NUMBERS  
DEPT., AMERICAN INSTITUTE OF PHYSICS, 335 EAST 45  
ST., NEW YORK, N. Y. 10017. PC\$5.00.

SUPPLEMENTARY NOTE: SPONSORED IN PART BY FEDERAL  
AVIATION ADMINISTRATION. LIBRARY OF CONGRESS CARD  
CATALOG NO. 72-96208. INTERNATIONAL STANDARD BOOK  
NO. 0-88318-201-7.

DESCRIPTORS: (\*SONIC BOOM, SYMPOSIA), ACOUSTICS,  
SUPERSONIC FLIGHT, SHOCK WAVES, PROPAGATION,  
STRESS(PHYSIOLOGY), HUMANS, ANIMALS, BEHAVIOR (U)  
IDENTIFIERS: NOISE POLLUTION, RAY TRACING (U)

A MAJOR ENVIRONMENTAL EFFECT OF SUPERSONIC FLIGHT  
THAT SETS IT APART FROM OTHER AIRCRAFT OPERATIONS IS  
THE SONIC BOOM. THE WAVE PATTERN THAT TRAVELS WITH  
THE AIRCRAFT--RATHER LIKE THE BOW WAVE OF A SHIP--  
SWEEPS OVER UNDERLYING AREAS AND MIMICS THE ADVANCING  
SHOCK WAVE OF A MILD EXPLOSION. IMPELLED BY THE  
PROSPECT OF CIVIL SUPERSONIC TRANSPORT (SST)  
AIRCRAFT, THERE HAS BEEN A GREAT VOLUME OF RESEARCH  
ON THE SONIC BOOM AND ITS EFFECTS, PARTICULARLY  
DURING THE LAST DECADE. THE STATE-OF-THE-ART AS OF  
1965 WAS SUMMED UP IN THE FIRST SONIC BOOM  
SYMPOSIUM SPONSORED BY THE ACOUSTICAL SOCIETY  
OF AMERICA, HELD IN ST. LOUIS. THE STATE-OF-  
THE-ART AS OF 1970 WAS LARGELY SUMMED UP IN THE  
SECOND SONIC BOOM SYMPOSIUM HELD IN HOUSTON  
FIVE YEARS LATER ON 3 NOVEMBER 1970. THE 1970  
SYMPOSIUM CONSISTED AGAIN OF A SERIES OF INVITED  
PAPERS, FOR THE MOST PART OF A SURVEY NATURE. THE  
AUTHORS WERE DRAWN FROM THE INTERNATIONAL COMMUNITY  
OF RESEARCHERS ON SONIC BOOM AND ITS EFFECTS.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 754 784 13/2  
STANFORD RESEARCH INST MENLO PARK CALIF

SUPPORT OF ENVIRONMENTAL PROGRAM  
PLANNING.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,  
OCT 72 391P MACKIN, JAMES L. ; SCHMIDT,  
RICHARD A. ;  
CONTRACT: N00014-72-C-0445, ARPA ORDER-2195  
PROJ: NR-089-091, SRI-1878

UNCLASSIFIED REPORT

DESCRIPTORS: (\*DEPARTMENT OF DEFENSE, \*ENVIRONMENT),  
(\*RESEARCH MANAGEMENT, ENVIRONMENT), SCIENTIFIC  
RESEARCH, NATURAL RESOURCES, AIR POLLUTION, WATER  
POLLUTION, HEAT, ECONOMICS, ELECTRIC POWER PRODUCTION,  
ENERGY, STRATOSPHERE, EXHAUST GASES, PESTICIDES, NOISE,  
SONIC BOOM, WEAPON SYSTEMS, MONITORS (U)  
IDENTIFIERS: WASTE DISPOSAL, NOISE POLLUTION, OILS,  
POLLUTION, REMOVAL, \*POLLUTION, \*RESEARCH MANAGEMENT,  
ROCKET EXHAUST, SOLID WASTE DISPOSAL, HAZARDOUS  
MATERIALS, LAND USE, THERMAL POLLUTION,  
ELECTROMAGNETIC RADIATION HAZARDS, ENVIRONMENTS,  
SURVEYS, ENVIRONMENTAL IMPACT S (U)

PRINCIPAL ENVIRONMENTAL PROBLEM AREAS OF IMPORTANCE  
TO THE DEPARTMENT OF DEFENSE WERE IDENTIFIED AND  
POSSIBLE APPROACHES TO ADVANCED RESEARCH PROJECTS  
DIRECTED TOWARD SOLUTIONS OF THESE PROBLEMS WERE  
SUGGESTED TO PROVIDE PARTIAL SOURCE MATERIAL IN  
SUPPORT OF DEFENSE ADVANCED RESEARCH PROJECTS  
AGENCY'S RESEARCH PROGRAM PLANNING. TOPICS  
REGARDING ENVIRONMENTAL IMPACT ANALYSIS, RESOURCES  
MANAGEMENT, AIR QUALITY, WATER QUALITY, MATERIALS  
HANDLING AND DISPOSAL, DATA MANAGEMENT AND SPECIAL  
PROBLEMS WERE INCLUDED. FOR EACH TOPIC,  
INFORMATION WAS ORGANIZED ACCORDING TO STATEMENT OF  
THE PROBLEM, STATE OF THE ART, PRESENT ACTIVITIES AND  
ORGANIZATION, IMPLICATIONS FOR THE DOD, AND  
RECOMMENDATIONS FOR FURTHER STUDIES. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 756 787 20/1  
DEUTSCHE FORSCHUNGS- UND VERSUCHSANSTALT FUER LUFT- UND  
RAUMFAHRT E V AACHEN (WEST GERMANY)

CLOSED FORM SOLUTION FOR THE SONIC BOOM IN  
A POLYTROPIC ATMOSPHERE, (U)

APR 72 8P STUFF, R. ;  
REPT. NO. DFVLR-SONDERDRUCK-251

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN JNL. OF AIRCRAFT, V9 N8  
P556-562 AUG 72.  
SUPPLEMENTARY NOTE: REVISION OF REPORT DATED 12 OCT  
71.

DESCRIPTORS: (\*SONIC BOOM, MATHEMATICAL ANALYSIS),  
VELOCITY, WEST GERMANY, SHOCK WAVES, FLIGHT PATHS (U)  
IDENTIFIERS: METHOD OF CHARACTERISTICS (U)

THE SONIC BOOM PROBLEM FOR TYPICAL AIRCRAFT  
MANEUVERS IN A POLYTROPIC ATMOSPHERE IS SOLVED  
ANALYTICALLY USING THE ANALYTIC METHOD OF  
CHARACTERISTICS. THE LINEARIZED WAVE PROPAGATION,  
WHICH SERVES AS INITIAL SOLUTION TO THE METHOD OF  
CHARACTERISTICS, IS SOLVED FIRST. THE  
CHARACTERISTIC METHOD IS MODIFIED TO ENCOMPASS THE  
CASE OF AN ONCOMING STREAM WITH VARIABLE SOUND  
VELOCITY. (AUTHOR MODIFIED ABSTRACT) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 756 790 20/1 4/1  
NATIONAL AERONAUTICAL ESTABLISHMENT OTTAWA (ONTARIO)

A DETERMINISTIC MODEL OF SONIC BOOM  
PROPAGATION THROUGH A TURBULENT ATMOSPHERE. (U)

DESCRIPTIVE NOTE: AERONAUTICAL REPT.,  
NOV 72 24P LEE, B. H. K.; RIBNER, H.  
S. ;

REPT. NO. NAE-LR-566  
MONITOR: NRC 12981

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, EQUATIONS OF MOTION),  
ATMOSPHERIC MOTION, TURBULENCE, SHOCK WAVES,  
PROPAGATION, PRESSURE, CANADA (U)  
IDENTIFIERS: WAVE EQUATIONS (U)

THE PROPAGATION OF A WEAK NORMAL SHOCK WAVE THROUGH  
A TURBULENT ATMOSPHERE IS STUDIED IN TERMS OF AN  
IDEALIZED MODEL. THE TURBULENT FIELD IS ASSUMED TO  
BE WEAK AND REPRESENTED BY THE SUPERPOSITION OF TWO  
INCLINED SHEAR WAVES OF OPPOSITE INCLINATION TO THE  
MEAN FLOW. THE RESULTING FLOW IS OF A CELLULAR  
NATURE. THE CELLS ARE RECTANGULAR IN SHAPE AND THE  
SENSE OF ROTATION OF THE FLOW ALTERNATES FROM CELL TO  
CELL. IF THE ANGLES MADE BY THE NORMAL OF THE  
INCIDENT SHEAR WAVES WITH THE DIRECTION OF THE MEAN  
FLOW ARE GREATER THAN SOME CRITICAL VALUE AN  
EXPONENTIALLY DECAYING PRESSURE WAVE IS GENERATED  
BEHIND THE SHOCK. 'SPIKED' OR 'ROUNDED' WAVEFORMS  
ARE OBTAINED BY ADDING OR SUBTRACTING THIS PRESSURE  
WAVE FROM THE STEADY STATE PRESSURE FIELD. AN  
ILLUSTRATIVE EXAMPLE FOR A MEAN FLOW MACH NUMBER OF  
1.0005 IS CONSIDERED. (AUTHOR) (U)



UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 757 273 20/1  
TENNESSEE UNIV SPACE INST TULLAHOMA

FUNDAMENTAL RESEARCH ON ADVANCED TECHNIQUES  
FOR SONIC BOOM SUPPRESSION.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,  
NOV 72 200P GEOTHERT, B. H. ; PAN, Y.  
S. ; CHAUDHURI, S. N. ; KOHL, R. ; GRUSCHKA, H. ;

CONTRACT: DOT-FA70WA-2260  
MONITOR: FAA-RD 73-4

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, REDUCTION), INTENSITY,  
THEORY, AERODYNAMIC CONFIGURATIONS, AIRFRAMES, WINGS,  
EXHAUST NOZZLES, EXHAUST GASES, SLOTTED FLAPS (U)  
IDENTIFIERS: NOISE REDUCTION (U)

A MULTIPHASE THEORETICAL INVESTIGATION ON  
PREDICTING AND ALLEVIATING SONIC BOOM INTENSITY IS  
DESCRIBED. A NEW THEORY TO PREDICT SONIC BOOM  
INTENSITY ON THE GROUND FROM WIND TUNNEL TESTS USING  
NORMAL SIZE MODELS (AS OPPOSED TO THE VERY SMALL  
MODELS PRESENTLY USED) WAS DEVELOPED. A  
RELATIVELY EASY METHOD TO DETERMINE AIRCRAFT CONTOURS  
WITH DESIRABLE FINITE PRESSURE RISE TIMES IS  
PRESENTED, AS IS A METHOD TO DETERMINE PHANTOM BODY  
SHAPES WITH DESIRABLE PRESSURE RISE TIMES WHICH CAN  
BE SIMULATED BY HEAT ADDITION TO THE FLOW UPSTREAM OF  
THE AIRCRAFT. IT IS SHOWN THAT A SLOTTED NOZZLE  
ENGINE EXHAUST HAS THE UNIQUE CAPABILITY TO SHIFT  
LIFT FROM THE SOLID SURFACE OF THE WING TO THE REGION  
BEHIND THE WING, WITH A RESULTING REDUCTION IN SONIC  
BOOM INTENSITY. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 758 239 6/6 20/1  
BUREAU OF SPORT FISHERIES AND WILDLIFE SEATTLE WASH WESTERN  
FISH DISEASE LAB

EFFECT OF SONIC BOOM ON FISH. (U)

DESCRIPTIVE NOTE: FINAL REPT.,  
FEB 73 72P RUCKER, ROBERT S. ;  
PROJ: FAA-202-556-015  
MONITOR: FAA-RD 73-29

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, \*FISHES), (•EGGS, FISHES),  
(•ECOLOGY, FISHES), MORTALITY RATES,  
EXPOSURE (PHYSIOLOGY) (U)  
IDENTIFIERS: NOISE POLLUTION (U)

A PROGRAM WAS INITIATED TO STUDY THE EFFECT OF SONIC BOOM ON FISH AND FISH EGGS DURING CRITICAL STAGES OF DEVELOPMENT. DURING THE DEVELOPMENT OF FISH EGGS THEY REACH A CRITICAL PERIOD WHERE THEY BECOME SENSITIVE TO VIBRATION OR DISTURBANCE. THIS PROGRAM WAS DESIGNED TO DETERMINE IF THE DISTURBANCES CAUSED BY SONIC BOOMS COULD HAVE A DETRIMENTAL EFFECT DURING THIS PERIOD. IT CONSISTED OF BOTH FIELD AND LABORATORY TESTS CONDUCTED AT SEVERAL NATIONAL FISH HATCHERIES (NFH). FISH EGGS FROM BOTH TROUT AND SALMON WERE REARED IN THE NORMAL MANNER, EXCEPT THAT WHEN THEY WERE IN THEIR MOST CRITICAL PHASE OF DEVELOPMENT THEY WERE EXPOSED TO SONIC BOOMS PRODUCED BY MILITARY AIRPLANES. EGG AND FISH FRY MORTALITIES FROM EXPOSED GROUPS OF EGGS WERE COMPARED TO THOSE FOR CONTROL GROUPS OF EGGS SPAWNED AT THE SAME TIME. THESE COMPARISONS INDICATED THAT THE SONIC BOOM EXPOSURE CAUSED NO INCREASE IN MORTALITY.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 760 720 13/13 20/1  
NEW YORK UNIV BRONX DEPT OF AERONAUTICS AND  
ASTRONAUTICS

EXPERIMENTAL-ANALYTIC DYNAMIC TECHNIQUES TO  
DETERMINE ACOUSTIC RESPONSE TO SONIC BOOM  
WITHIN STRUCTURES. (U)

DESCRIPTIVE NOTE: FINAL REPT. AUG 69-JUN 71,  
JUN 71 160P SLUTSKY, SIMON ; ARNOLD, LEE ;  
REPT. NO. NYU-AA-70-19  
CONTRACT: DOT-FA69WA-2145  
MONITOR: FAA-EQ 71-3

UNCLASSIFIED REPORT

DESCRIPTORS: (\*BUILDINGS, RESPONSE), (\*SONIC BOOM,  
TRANSIENTS), MODELS(SIMULATIONS), ACOUSTICS, STRUCTURAL  
PROPERTIES, SIMULATION, POWER SPECTRA, SOUND  
TRANSMISSION, COMPUTER PROGRAMS, NUMERICAL ANALYSIS (U)  
IDENTIFIERS: \*ACOUSTIC RESPONSE, \*ACOUSTIC WAVES,  
\*SPECTRA, COMPUTER AIDED ANALYSIS (U)

AN EXPERIMENTAL AND THEORETICAL PROGRAM WAS  
UNDERTAKEN TO DETERMINE THE TIME HISTORY OF THE  
AIRBORNE PRESSURE AND THE CORRESPONDING ACOUSTIC AND  
STRUCTURAL RESPONSE WITHIN ARCHITECTURAL STRUCTURES  
DUE TO SONIC BOOM TRANSIENTS, AND TO DETERMINE THOSE  
FEATURES OF SONIC BOOM SIGNATURE WHICH TEND TO SHAPE  
THE INTERIOR ACOUSTIC WAVEFORM. A SIMPLE SONIC BOOM  
WAVE GENERATOR WAS BUILT IN WHICH SMALL SCALE MODELS  
OF ARCHITECTURAL STRUCTURES WERE TESTED. THE  
PHENOMENON OF 'SPIKING' OCCURED AND WAS FOUND TO  
DEPEND ON THE RISE TIME OF THE INCIDENT WAVE, THE  
WINDOW DIMENSIONS AND THE DISTANCE OF THE MICROPHONE  
FROM THE WINDOW. INCREASE OF INCIDENT WAVE RISE  
TIME WAS FOUND TO RADICALLY ALTER THE HIGH FREQUENCY  
CONTENT OF THE ROOM RESPONSE. ALTHOUGH A  
COMPLETELY CLOSED STRUCTURE DID NOT GENERATE INTERNAL  
PRESSURE SPIKES, IT WAS FOUND THAT THE WALL  
ACCELERATION WAS DEPENDENT ON THE INCIDENT WAVE  
PRESSURE. THEN IN RESPONSE TO FAST RISE SONIC BOOM  
WAVES, A SIMPLE WALL COULD EXCITE SMALL OBJECTS, WITH  
HIGH RESONANT FREQUENCY THAT MIGHT BE COUPLED TO THE  
WALL. A GENERAL MATHEMATICAL PROCEDURE WAS  
DEVELOPED TO CALCULATE SYSTEM TRANSFER FUNCTIONS FROM  
MEASURED DATA. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 761 495 11/2  
WYLE LABS HUNTSVILLE ALA

EFFECTS OF REPETITIVE SONIC BOOMS ON GLASS  
BREAKAGE.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,  
APR 72 252P WHITE, R. W. ;  
REPT. NO. WR-72-4  
CONTRACT: DOT-FA71WA-2645  
MONITOR: FAA-RD 72-43

UNCLASSIFIED REPORT

DESCRIPTORS: (\*GLASS, \*SONIC BOOM), FATIGUE(MECHANICS),  
FRACTURE(MECHANICS), COMPUTER PROGRAMS, PRESSURE,  
SIMULATION (U)  
IDENTIFIERS: \*WINDOW GLASS, OVERPRESSURE, FORTRAN,  
FORTRAN 4 PROGRAMMING LANGUAGE (U)

AN EXPERIMENTAL PROGRAM WAS CONDUCTED IN WHICH  
FIFTY-EIGHT SQUARE PANES (EDGE LENGTHS OF 3 FT AND  
4 FT) OF SINGLE STRENGTH WINDOW GLASS WERE EXPOSED  
TO REPETITIVE SONIC BOOM ENVIRONMENTS IN ORDER TO  
MEASURE RESPONSE CHARACTERISTICS, DYNAMIC STRENGTHS  
AND CUMULATIVE DAMAGE EFFECTS FOR RESIDENTIAL WINDOWS  
CONTINUALLY EXPOSED TO SONIC BOOMS GENERATED BY  
SUPERSONIC AIRCRAFT. (MODIFIED AUTHOR  
ABSTRACT)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM09

AD- 762 988 6/19  
CIVIL AEROMEDICAL INST OKLAHOMA CITY OKLA

SIMULATED SONIC BOOMS AND SLEEP: EFFECTS  
OF REPEATED BOOMS OF 1.0 PSF, (U)

DEC 72 31P COLLINS, WILLIAM E. ;  
IAMPINETRO, P. F. ;  
PROJ: FAA-AM-B-70-PSY-24, FAA-AM-B-71-PSY-24  
MONITOR: FAA-AM 72-35

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SLEEP, \*SONIC BOOM), NOISE,  
STRESS(PHYSIOLOGY), ACCLIMATIZATION, PSYCHOPHYSIOLOGY,  
AGING(PHYSIOLOGY) (U)  
IDENTIFIERS: \*NOISE POLLUTION (U)

EIGHT MALE SUBJECTS IN EACH OF THREE AGE GROUPS  
(21-26, 40-45, 60-72 YEARS) SLEPT IN PAIRS IN THE  
CAMI SONIC BOOM SIMULATION FACILITY FOR 21  
CONSECUTIVE NIGHTS. THE FIRST FIVE NIGHTS WERE  
USED TO ACCLIMATE THE SUBJECTS (NIGHTS 1 AND 2)  
AND TO OBTAIN BASELINE DATA (NIGHTS 3-5); THE  
12 SUBSEQUENT NIGHTS (BOOM) INVOLVED THE HOURLY  
PRESENTATION OF SIMULATED SONIC BOOMS AT AN  
OVERPRESSURE LEVEL OF 1.0 PSF (AS THOUGH MEASURED  
'OUTDOORS'); DURING FOUR ADDITIONAL NIGHTS  
(RECOVERY) THERE WERE NO BOOM PRESENTATIONS.  
ALL-NIGHT RECORDS OF EEG, EOG, EMG, ECG,  
AND BSR WERE OBTAINED AND ANALYZED. NONE OF  
THESE PHYSIOLOGICAL MEASURES SHOWED ANY STATISTICALLY  
SIGNIFICANT EFFECT OF THE BOOM PRESENTATIONS ON  
NIGHTLY SLEEP PATTERNS. (MODIFIED AUTHOR  
ABSTRACT) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 763 594 11/2 13/3 20/1  
B00Z-ALLEN APPLIED RESEARCH INC BETHESDA MD

STATISTICAL PREDICTION MODEL FOR GLASS  
BREAKAGE FROM NOMINAL SONIC BOOM LOADS. (U)

DESCRIPTIVE NOTE: FINAL REPT.,  
JAN 73 216P HERSHEY, ROBERT L. HIGGINS,  
THOMAS H. I  
CONTRACT: DOT-FA72WA-2823  
MONITOR: FAA-RD 73-79

UNCLASSIFIED REPORT

DESCRIPTORS: (\*BUILDINGS, GLASS), (\*GLASS,  
FAILURE(MECHANICS)), (\*SONIC BOOM, BUILDINGS),  
CONFIGURATION, LOADS(FORCES), STRESSES, PROBABILITY  
DENSITY FUNCTIONS, CRACKS, RANDOM VARIABLES (U)  
IDENTIFIERS: WINDOWS, OVERPRESSURE, BREAKAGE, COMPUTER  
AIDED ANALYSIS (U)

A STATISTICAL MODEL WAS DEVELOPED WHICH CAN BE USED  
TO ESTIMATE THE PROBABILITY OF GLASS BREAKAGE FROM  
SONIC BOOMS AS A FUNCTION OF THEIR NOMINAL  
OVERPRESSURE. OTHER PARAMETERS WHICH CAN BE TAKEN  
INTO ACCOUNT IN BREAKAGE PROBABILITY CALCULATIONS  
WITH THIS MODEL INCLUDE WINDOW SIZE, AIRCRAFT VECTOR,  
BOOM DURATION, AND WHETHER THE GLASS WAS PREVIOUSLY  
IN GOOD CONDITION OR CRACKED. A MODEL WINDOW  
POPULATION HAS BEEN DEVISED FROM AVAILABLE DATA WHICH  
INCLUDES THE DISTRIBUTIONS OF DYNAMIC AMPLIFICATION  
FACTORS AND BREAKING PRESSURES FOR SEVEN WINDOW  
TYPES. PROVISION HAS BEEN MADE IN THE MODEL TO  
TREAT .61% OF THE WINDOW POPULATION AS CRACKED  
GLASS. FROM COMPUTER GENERATION OF HISTOGRAMS FROM  
TEST DATA, THE DISTRIBUTION OF BOTH SONIC BOOM  
STRESSES AND GLASS STRENGTHS WERE FOUND TO BE  
LOGNORMAL. BY USE OF THE MODEL, IT WAS ESTIMATED  
THAT THERE WOULD BE 1.1 BREAKS PER MILLION PANES IN  
GOOD CONDITION BOOMED AT A NOMINAL OVERPRESSURE OF 1  
PSF. THIS ESTIMATE AGREES WELL WITH SONIC BOOM  
CLAIMS DATA. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 766 326 6/19  
MAN-ACOUSTICS AND NOISE INC SEATTLE WASH

THE EFFECT OF SIMULATED SONIC BOOM RISE  
TIME AND OVERPRESSURE ON  
ELECTROENCEPHALOGRAPHIC WAVEFORMS AND  
DISTURBANCE JUDGMENTS.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,  
JUL 73 39P MABRY, J. E. IPARRY, H. J.

REPT. NO. MAN-1004  
CONTRACT: DOT-FA73WA-3213  
PROJ: FAA-202-554-015  
MONITOR: FAA-RD 73-115

UNCLASSIFIED REPORT

DESCRIPTORS: (\*ELECTROENCEPHALOGRAPHY, \*SONIC BOOM),  
(\*NOISE, \*SLEEP), SIMULATION, STRESS(PHYSIOLOGY),  
AIRCRAFT NOISE, JET AIRCRAFT

(U)

THE THREE MAIN OBJECTIVES OF THIS STUDY WERE AS  
FOLLOWS: DETERMINE THE FEASIBILITY OF  
INVESTIGATING EFFECT OF SIMULATED SONIC BOOMS ON SOME  
SLEEP PATTERNS OF PERSONS UNDERGOING ROUTINE  
ELECTROENCEPHALOGRAPHIC (EEG) EXAMINATIONS;  
DETERMINE THE EXTENT THAT EEG WAVEFORMS ARE ALTERED  
BY THE SIMULATED SONIC BOOMS; AND OBTAIN  
'DISTURBANCE', JUDGMENTS AS A FUNCTION OF THE  
SIMULATED BOOM NOISES. RESULTS WERE OBTAINED FROM  
FIFTY (50) SUBJECTS OF BOTH SEXES WITH AGES  
RANGING FROM 15 TO 72 YEARS OF AGE. DATA WAS  
RELEVANT TO RESTING, DOZING, OR LIGHT SLEEP. THE  
EEG WAVEFORMS FOR RESTING OR DOZING PERSONS WAS NOT  
CHANGED BY THE SIMULATED BOOM NOISES. IN GENERAL,  
THE SUBJECTS WERE NOT, 'DISTURBED', BY THE SIMULATED  
BOOMS. NINETY-TWO (92) PERCENT OF THE SUBJECTS  
REPORTED NO, 'DISTURBANCE', TO ANY OF THE SIMULATED  
BOOMS PRESENTED. TWO RISE TIMES OF 15 AND 7 MS  
WERE EMPLOYED WITH OVERPRESSURES RANGING FROM 0.94 TO  
2.85 PSF. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 767 454 13/13 20/1 11/2  
FEDERAL AVIATION ADMINISTRATION WASHINGTON D C SYSTEMS  
RESEARCH AND DEVELOPMENT SERVICE

A POTENTIAL DESIGN WINDOW FOR SUPERSONIC  
OVERFLIGHT BASED ON THE PERCEIVED LEVEL  
(PLDB) AND GLASS DAMAGE PROBABILITY OF  
SONIC BOOMS. (U)

DESCRIPTIVE NOTE: FINAL REPT.,  
AUG 73 28P HIGGINS, THOMAS H. ;  
CARPENTER, LARRY K. ;  
REPT. NO. FAA-RD-73-116

UNCLASSIFIED REPORT

DESCRIPTORS: (\*GLASS, DAMAGE), (\*SUPERSONIC FLIGHT,  
\*SONIC BOOM), JET PLANE NOISE, PRESSURE, SONIC FATIGUE,  
ACOUSTICS, TOLERANCES (PHYSIOLOGY) (U)  
IDENTIFIERS: WINDOW GLASS, OVERPRESSURE, SOUND  
PRESSURE, DESIGN CRITERIA (U)

A POTENTIAL DESIGN WINDOW FOR SUPERSONIC OVERFLIGHT  
BASED ON THE PERCEIVED LEVEL (PLDB) AND GLASS  
DAMAGE PROBABILITY OF SONIC BOOMS IS OUTLINED. THE  
EVALUATION OF A SIMPLE OPERATIONAL METHOD OF  
ESTIMATING THE PERCEIVED LEVEL (PLDB) OF SONIC  
BOOMS IS DISCUSSED AND COMPARED WITH THE FOURIER  
TRANSFORM COMPUTER PROGRAM CALCULATIONS OF PEASE  
BASED ON THE THEORY OF ZEPLER AND HAREL. THE  
RESULTING ESTIMATED PERCEIVED LEVELS ARE IN GOOD  
AGREEMENT I.E., WITHIN 1 TO 2 PLDB OF EACH OTHER  
IN THE IMPORTANT POTENTIAL CERTIFICATION OR DESIGN  
WINDOW THAT IS IN THE 90 TO 100 PLDB RANGE.  
THESE PERCEIVED LEVELS ARE SHOWN TO BE ACCEPTABLE  
TO 95 TO 100 PERCENT OF THE PEOPLE EXPOSED TO THEM.  
(MODIFIED AUTHOR ABSTRACT) (U)



UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 768 847 20/1  
FEDERAL AVIATION ADMINISTRATION WASHINGTON D C OFFICE OF  
SYSTEMS ENGINEERING MANAGEMENT

ENGINEERING AND DEVELOPMENT PROGRAM PLAN -  
AIRCRAFT NOISE AND SONIC BOOM. (U)

JUN 73 38P  
REPT. NO. FAA-ED-20-2

UNCLASSIFIED REPORT

DESCRIPTORS: (AIRCRAFT NOISE, ACOUSTIC IMPEDANCE), JET  
PLANE NOISE, SONIC BOOM, ENGINE NOISE,  
STRESS(PHYSIOLOGY), TOLERANCES(PHYSIOLOGY), LAW,  
PLANNING (U)

IDENTIFIERS: NOISE, NOISE EXPOSURE, NOISE REDUCTION,  
NOISE REDUCTION, NOISE POLLUTION, ENVIRONMENTAL NOISE  
EXPOSURE MEASUREMENT (U)

THE REPORT DESCRIBES A PROGRAM PLAN DESIGNED TO  
PROVIDE A DATA BASE FROM WHICH TO DEVELOP RULE MAKING  
FOR CONTROL AND ABATEMENT OF AIRCRAFT NOISE AND SONIC  
BOOM. PRIMARY OBJECTIVES ARE TO MINIMIZE THE  
ENVIRONMENTAL IMPACT OF AIRCRAFT GENERATED NOISE AND  
SONIC BOOM AND TO DEVELOP PREDICTION, REDUCTION AND  
CERTIFICATION CRITERIA FOR ALL CATEGORIES OF  
AIRCRAFT. DEVELOPMENT ACTIVITIES CURRENTLY IN  
PROGRESS PLUS PROGRAMS PLANNED FOR A PERIOD OF  
APPROXIMATELY FIVE YEARS ARE DESCRIBED.  
(AUTHOR) (U)

UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZDM09

AD- 768 853 6/19 6/6  
TEER (JAMES G) AND CO COLLEGE STATION TEX

STUDIES OF THE EFFECTS OF SONIC BOOM ON  
BIRDS.

(U)

DESCRIPTIVE NOTE: FINAL REPT. 1 MAR-15 AUG 73,  
SEP 73 90P TEER, JAMES G. ; TRUETT, JOE  
C. ;

PROJ: FAA-202-554-015  
MONITOR: FAA-RD 73-148

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, \*BIRDS),  
REPRODUCTION(PHYSIOLOGY), GROWTH(PHYSIOLOGY), MORTALITY  
RATES, SURVIVAL(PERSONNEL), AIRCRAFT NOISE, AIRPORTS (U)

A FIELD STUDY WAS CARRIED OUT NEAR GLEN ROSE,  
TEXAS TO TRY TO DISCOVER IF OCCURRENCE OF SONIC  
BOOMS CREATED BY OVERFLYING AIRCRAFT WAS ADVERSELY  
AFFECTING REPRODUCTION OF WILD BIRDS. SEVERAL  
MEASURES OF REPRODUCTION SUCCESS IN MOURNING DOVES,  
MOCKINGBIRDS, CARDINALS, AND LARK SPARROWS WERE  
COMPARED BETWEEN A TEST AREA AND A CONTROL AREA.  
THE TEST AREA WAS SUBJECT TO SONIC BOOM OCCURRING  
TWO OR THREE TIMES A WEEK; THE CONTROL AREA WAS  
ESSENTIALLY FREE FROM SONIC BOOM DISTURBANCE. IN  
THE FINAL ANALYSIS, THE AUTHORS COULD FIND NO  
EVIDENCE THAT SONIC BOOM DISTURBANCE AFFECTED PHASES  
OF BIRD REPRODUCTION STUDIES IN THE PROGRAM.  
STUDIES OF THE EFFECTS OF PRESSURE ON GROWTH,  
REPRODUCTION AND MORTALITY OF BOBWHITE QUAIL WERE  
MADE IN THE LABORATORY WITH EQUIPMENT DESIGNED TO  
DELIVER PRESSURE TREATMENTS UNDER CONTROLLED  
CONDITIONS. RESULTS OF THESE EXPERIMENTS SHOWED  
THAT THE PRESSURES HAD NO EFFECTS ON HATCHING  
SUCCESS, GROWTH RATES, OR MORTALITY. (MODIFIED  
AUTHOR ABSTRACT)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 769 970 20/1 1/3  
DEFENSE DOCUMENTATION CENTER ALEXANDRIA VA

ENVIRONMENTAL POLLUTION: NOISE POLLUTION -  
SONIC BOOM.

(U)

DESCRIPTIVE NOTE: REPORT BIBLIOGRAPHY APR 59-FEB 73.  
NOV 73 179P  
REPT. NO. DDC-TAS-73-74

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SUPERSEDES AD-722 910.

DESCRIPTORS: (\*SONIC BOOM, \*BIBLIOGRAPHIES),  
(\*JET AIRCRAFT, \*NOISE POLLUTION), SUPERSONIC  
AIRCRAFT, JET TRANSPORT PLANES, PUBLIC OPINION,  
PSYCHOACOUSTICS, LAW, JET PLANE NOISE, SHOCK  
WAVES, ABSTRACTS

(U)

THE REFERENCES IN THE BIBLIOGRAPHY COVER A WIDE  
RANGE OF THE PARAMETER OF SONIC BOOM AND NOISE  
POLLUTION, AS WELL AS DAMAGES CAUSED BY IT.  
CORPORATE AUTHOR/MONITORING AGENCY,  
SUBJECT, AND PERSONAL AUTHOR INDEXES ARE  
INCLUDED. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 771 274 1/3 20/1  
BOEING COMMERCIAL AIRPLANE CO SEATTLE WASH

SONIC BOOM LITERATURE SURVEY. VOLUME II.  
CAPSULE SUMMARIES.

(U)

DESCRIPTIVE NOTE: FINAL REPT. JUN 72-SEP 73,  
SEP 73 348P RUNYAN, LARRY J. ; KANE,  
EDWARD J. ;  
REPT. NO. D6-41292-2  
CONTRACT: DOT-FA72WA-3039  
MONITOR: FAA-RD 73-129-VOL-2

UNCLASSIFIED REPORT

DESCRIPTORS: \*SONIC BOOM, \*LITERATURE SURVEYS,  
SOUND TRANSMISSION, JET PLANE NOISE, JET AIRCRAFT,  
RESPONSE(BIOLOGY), THRESHOLDS(PHYSIOLOGY),  
ANIMALS

(U)

THE PURPOSE OF THE REPORT IS TO PROVIDE A REFERENCE  
FOR INVESTIGATORS IN THE FIELD OF SONIC BOOM TO HELP  
IN ELIMINATING POSSIBLE DUPLICATION OF FUTURE EFFORTS  
BY COMPILING IN ONE DOCUMENT THE RESULTS OF ALL  
PUBLISHED SONIC BOOM INVESTIGATIONS. VOLUME 2  
CONSISTS OF A COMPREHENSIVE ANNOTATED REFERENCE OF  
ALL SONIC BOOM STUDIES IN THE FORM OF CAPSULE  
SUMMARIES. EACH CAPSULE SUMMARY CONTAINS A  
COMPLETE REFERENCE OF THE PAPER, A STATEMENT OF ITS  
PURPOSE, A SUMMARY OF SIGNIFICANT RESULTS, A  
COMPARISON OF THE WORK WITH OTHER SIMILAR PAPERS, AND  
AN EVALUATION OF THE PAPER. SUBJECT AND AUTHOR  
INDEXES ARE GIVEN AT THE END OF THE REPORT.  
(MODIFIED AUTHOR ABSTRACT)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 773 382 20/1 1/3  
BOEING COMMERCIAL AIRPLANE CO SEATTLE WASH

SONIC BOOM LITERATURE SURVEY. VOLUME I.  
STATE OF THE ART. (U)

DESCRIPTIVE NOTE: FINAL REPT. JUN 72-SEP 73,  
SEP 73 173P RUNYAN, LARRY J. ; KANE,  
EDWARD J. ;  
REPT. NO. D6-41292-1  
CONTRACT: DOT-FA72WA-3039  
PROJ: FAA-202-554-015  
MONITOR: FAA-RD 73-129-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-771 274.

DESCRIPTORS: \*SONIC BOOM, \*LITERATURE SURVEYS,  
STATE OF THE ART, THRESHOLDS(PHYSIOLOGY),  
SOUND TRANSMISSION, JET PLANE NOISE,  
RESPONSE(BIOLOGY), ANIMALS (U)

THE REPORT PROVIDES A REFERENCE FOR INVESTIGATORS  
IN THE FIELD OF SONIC BOOM TO HELP IN ELIMINATING  
POSSIBLE DUPLICATION OF FUTURE EFFORTS BY COMPILING  
IN ONE DOCUMENT THE RESULTS OF ALL PUBLISHED SONIC  
BOOM INVESTIGATIONS. THE REPORT CONTAINS A SUMMARY  
OF THE CURRENT STATE OF THE ART. ITS PURPOSE IS TO  
ACQUAINT THE READER WITH THE SUBJECT IN SUFFICIENT  
DEPTH TO ALLOW EVALUATION OF SUBSEQUENT TECHNICAL  
WORK OR THE COMPLETION OF CURRENT UNFINISHED  
INVESTIGATIONS. FUNDAMENTAL CONCEPTS, IDEAS, AND  
STUDY RESULTS OF SONIC BOOM WORK IN THE AREAS OF  
GENERATION, PROPAGATION, MINIMIZATION, HUMAN RESPONSE  
AND SOCIAL CRITERIA, STRUCTURAL RESPONSE, ANIMAL  
RESPONSE, THRESHOLD MACH NUMBER, SIMULATION  
METHODS, AND INSTRUMENTATION TECHNIQUES ARE  
SUMMARIZED. ASPECTS OF SONIC BOOM THAT NEED  
FURTHER RESEARCH ARE ALSO IDENTIFIED. (MODIFIED  
AUTHOR ABSTRACT) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 773 451 6/19  
CIVIL AEROMEDICAL INST OKLAHOMA CITY OKLA

SONIC BOOM STARTLE EFFECTS--REPORT OF A  
FIELD STUDY,

(U)

JUL 73 20P THACKRAY, RICHARD I. ;  
RYLANDER, RAGNAR ; TOUCHSTONE, R. MARK ;  
MONITOR: FAA-AM 73-11

UNCLASSIFIED REPORT

DESCRIPTORS: \*SONIC BOOM, \*NOISE POLLUTION,  
AVIATION MEDICINE, PSYCHOPHYSIOLOGY, SOUND,  
STIMULATION, REACTION(PSYCHOLOGY),  
STRESS(PHYSIOLOGY), THRESHOLDS(PHYSIOLOGY),  
SWEDEN, FEMALES  
IDENTIFIERS: \*STARTLE RESPONSE

(U)

(U)

THE STUDY REPORTS THE RESULTS OF A SONIC BOOM FIELD  
STUDY CONDUCTED IN SWEDEN DURING OCTOBER 1972.  
TEN FEMALE SUBJECTS WERE TESTED INDOORS ON EACH OF  
SIX DAYS. TWO AGE GROUPS WERE STUDIED: 20-35  
AND 50-65 YEARS. FIGHTER AIRCRAFT FLYING AT VARIOUS  
HEIGHTS OVER THE TEST SITE PRODUCED BOOMS WITH  
OUTDOOR OVERPRESSURES RANGING FROM 60-640 N/SQ.M.  
THE NUMBER OF BOOMS EXTENDED FROM 5 TO 13 PER DAY.  
SUBJECTS PERFORMED INDOORS ON AN ARM-HAND  
STEADINESS TASK. THE RESULTS INDICATED THAT  
OUTDOOR OVERPRESSURES RANGING FROM 70-120 N/SQ.M.  
(26-35 N/SQ.M. INDOORS) PRODUCED REFLEXIVE ARM-  
HAND MOVEMENTS IN ABOUT 10 PER CENT OF THE SUBJECTS.  
BOOMS OF 300 N/SQ.M. (67 N/SQ.M. INDOORS)  
AND GREATER PRODUCED RESPONSES IN ABOUT 75 PER CENT  
OF THE SUBJECTS. BETWEEN THESE EXTREMES OF  
OVERPRESSURE THERE WAS THE SUGGESTION OF A CRITICAL  
OVERPRESSURE RANGE LYING BETWEEN 150-180 N/SQ.M.  
(40-46 N/SQ.M. INDOORS) IN WHICH AN ABRUPT  
INCREASE IN STARTLE RESPONSE OCCURRED. (MODIFIED  
AUTHOR ABSTRACT)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 775 095 1/2 20/1 1/3  
TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES

A NUMERICAL STUDY OF THE EFFECTS OF AIRCRAFT  
MANOEUVERS ON THE FOCUSING OF SONIC BOOMS,

(U)

JUL 73 119P ONYEONWU, RONALD O. ;  
REPT. NO. UTIAS-192  
CONTRACT: AF-AFOSR-1885-70  
PROJ: AF-9783  
TASK: 978306  
MONITOR: AFOSR TR-74-0181

UNCLASSIFIED REPORT

DESCRIPTORS: \*JET AIRCRAFT, \*FLIGHT MANEUVERS,  
\*SONIC BOOM, \*FOCUSING, SHOCK WAVES, ACOUSTIC  
BEAMS, RAY TRACING, ATMOSPHERE MODELS,  
MATHEMATICAL MODELS, CANADA

(U)

THE EFFECTS OF AIRCRAFT MANEUVERS ON THE FOCUSING  
OF SONIC BOOMS ARE INVESTIGATED FOR A MODEL  
ATMOSPHERE WHICH IS PIECEWISE LINEAR IN WIND AND  
SOUND SPEEDS, AND PIECEWISE CONSTANT IN WIND  
DIRECTION. RAY-TUBE AREAS AND TRAJECTORIES ARE  
OBTAINED IN CLOSED FORM FOR A REAL ATMOSPHERE WITH  
WINDS AND AIRCRAFT IN ARBITRARY MANEUVERS. A  
MATHEMATICAL FORMALISM IS DEVELOPED FOR IDENTIFYING  
THE FOCUSING RAY IN GENERAL MANEUVERS, LEADING TO A  
DIRECT AND ACCURATE DETERMINATION OF THE CAUSTIC  
SURFACE GROUND INTERCEPT. THE ALGORITHMS DERIVED  
IN THE ANALYSIS COMPLEMENT THOSE OF HAYES TO FORM  
THE BASIS FOR A COMPUTER PROGRAM FOR PREDICTING SONIC  
BOOM PROPERTIES. THERE APPEARS TO BE A TEN-FOLD  
REDUCTION IN COMPUTING TIME AS COMPARED WITH THE  
HAYES-HAEFELI PROGRAM. (MODIFIED AUTHOR  
ABSTRACT)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 775 555 1/1 1/3  
CORNELL UNIV ITHACA N Y

THE DESIGN OR OPERATION OF AIRCRAFT TO  
MINIMIZE THEIR SONIC BOOM,

(U)

73 10P SEEBASS, A. R. 1

UNCLASSIFIED REPORT

AVAILABILITY: PAPER COPY AVAILABLE FROM AIAA, 1290  
AVENUE OF THE AMERICAS, NEW YORK, N.Y.  
10019.

SUPPLEMENTARY NOTE: PRESENTED AT AIAA AIRCRAFT DESIGN,  
FLIGHT TEST AND OPERATIONS MEETING (5TH) ST.  
LOUIS, MO., 6-8 AUG 73. PAPER NO. 73-817.

DESCRIPTORS: \*SUPERSONIC AIRCRAFT, \*SONIC BOOM,  
\*NOISE REDUCTION, SHOCK WAVES, AERODYNAMIC  
CONFIGURATIONS, SUPERSONIC FLIGHT, OVERPRESSURE  
IDENTIFIERS: \*DESIGN CRITERIA

(U)

(U)

MEANS OF REDUCING OR ELIMINATING THE SONIC BOOM  
THROUGH AERODYNAMIC DESIGN OR AIRCRAFT OPERATION ARE  
DISCUSSED. THESE INCLUDE DESIGNING AIRCRAFT TO  
MINIMIZE OR ELIMINATE CERTAIN FEATURES OF THE  
OVERPRESSURE SIGNATURE, OPERATING AIRCRAFT AT  
SLIGHTLY SUPERSONIC SPEEDS SO THAT THE SONIC BOOM  
DOES NOT REACH THE GROUND, AND SEEKING REDUCTIONS  
THROUGH THE HIGH ALTITUDE-HIGH SPEED FLIGHT  
CONDITIONS OF HYPERSONIC TRANSPORTS. A SIMPLE  
COMPUTER PROGRAM HAS BEEN DEVELOPED THAT DETERMINES  
THE AREA DEVELOPMENT OF THE EQUIVALENT BODY OF  
REVOLUTIONN REQUIRED TO MINIMIZE VARIOUS SONIC BOOM  
SIGNATURE PARAMETERS. (AUTHOR)

(U)



UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 776 136 6/5 6/19  
CIVIL AEROMEDICAL INST OKLAHOMA CITY OKLA

AVIATION MEDICINE TRANSLATIONS: ANNOTATED  
BIBLIOGRAPHY OF RECENTLY TRANSLATED MATERIAL.  
VIII, (U)

DEC 73 14P CONSTANT, GREGORY N. ;  
GOULDEN, D. R. ; GRIMM, E. JEAN ;  
PROJ: FAA-AM-A-73-PSY-33, FAA-AM-D-74-PSY-33  
MONITOR: FAA-AM 73-19

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO REPORT DATED MAY 72, AD-  
747 125.

DESCRIPTORS: \*AVIATION MEDICINE, \*BIBLIOGRAPHIES,  
TRANSLATIONS, STRESS (PHYSIOLOGY), VESTIBULAR  
APPARATUS, CARDIOVASCULAR SYSTEM, NYSTAGMUS,  
PERFORMANCE (HUMAN), CARBON MONOXIDE, BLOOD,  
VISION, SONIC BOOM, AVIATION SAFETY (U)

AN ANNOTATED BIBLIOGRAPHY OF TRANSLATIONS OF  
FOREIGN-LANGUAGE ARTICLES IS PRESENTED. THE 22  
LISTED ENTRIES ARE CONCERNED WITH STUDIES OF  
EQUILIBRATION TESTS, VESTIBULAR FUNCTION, OPTOKINETIC  
NYSTAGMUS, ELECTRONYSTAGMOGRAPHY, CARDIOVASCULAR  
REACTIONS TO NOISE STRESS, STRESS AND PERFORMANCE,  
APTITUDES FOR FLYING, FACIAL RECONSTRUCTION  
TECHNIQUES IN THE IDENTIFICATION OF HUMAN REMAINS  
FROM ACCIDENTS, ATTITUDES AND PERFORMANCE OF AIR  
TRAFFIC CONTROLLERS, TECHNIQUES FOR DETERMINING  
LEVELS OF CARBON MONOXIDE IN THE BLOOD, NOISE,  
VISION, CARDIOLOGY, FLIGHT SAFETY, AND ANIMAL  
RESPONSES TO SONIC BOOMS. PROCEDURES FOR OBTAINING  
COPIES OF THE TRANSLATIONS ARE INCLUDED.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 777 581 6/19  
FEDERAL AVIATION ADMINISTRATION WASHINGTON D C OFFICE OF  
AVIATION MEDICINE

A COMPARISON OF THE STARTLE EFFECTS  
RESULTING FROM EXPOSURE TO TWO LEVELS OF  
SIMULATED SONIC BOOMS, (U)

DEC 73 14P THACKRAY, RICHARD I. ;  
TOUCHSTONE, ROBERT M. ; BAILEY, JOE P. ;  
REPT. NO. FAA-AM-73-16

UNCLASSIFIED REPORT

DESCRIPTORS: \*SONIC BOOM, PSYCHOMOTOR FUNCTIONS,  
STRESS(PHYSIOLOGY), RESPONSE(BIOLOGY),  
PERFORMANCE(HUMAN), HEART, EYE, GALVANIC  
SKIN RESPONSE, REFLEXES, NOISE, AUTONOMIC NERVOUS  
SYSTEM (U)  
IDENTIFIERS: \*STARTLE RESPONSES, NOISE POLLUTION,  
HEART RATE (U)

SUBJECTS WERE EXPOSED INDOORS TO SIMULATED SONIC  
BOOMS HAVING OUTSIDE OVERPRESSURES OF 50 AND 150 N/  
SQ M. RISE TIMES WERE HELD CONSTANT AT 5.5 MSECS.  
IN ADDITION TO THE OUTSIDE MEASUREMENTS, INSIDE  
MEASURES OF DBL IN AND DBA WERE ALSO OBTAINED.  
SUBJECTS ATTEMPTED TO HOLD A HAND-STEADINESS DEVICE  
ON TARGET DURING BOOM EXPOSURE AND AMPLITUDE OF THE  
ARM-HAND STARTLE RESPONSE WAS DETERMINED.  
RECORDINGS WERE ALSO OBTAINED OF THE SKIN  
CONDUCTANCE AND HEART-RATE RESPONSES AS WELL AS THE  
EYE-BLINK REFLEX. ALTHOUGH THE 50 N/SQ M BOOM  
PRODUCED SLIGHT ARM-HAND STARTLE RESPONSES IN A SMALL  
PERCENTAGE OF SUBJECTS, THE FREQUENCY OF THESE  
RESPONSES WAS SIGNIFICANTLY GREATER TO THE HIGHER  
BOOM LEVEL. TENTATIVE CONCLUSIONS ADVANCED THAT  
SONIC BOOMS EXPERIENCED INDOORS MAY CAUSE SLIGHT ARM-  
HAND STARTLE RESPONSES WHICH COULD HAVE ADVERSE  
EFFECTS ON OCCUPATIONAL TASKS IN WHICH ARM-HAND  
STEADINESS IS THE PRINCIPAL SKILL REQUIRED, BUT THAT  
IT SEEMS UNLIKELY THESE RESPONSES WOULD SIGNIFICANTLY  
IMPAIR PERFORMANCE ON LESS SENSITIVE PSYCHOMOTOR  
TASKS. (MODIFIED AUTHOR ABSTRACT) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 778 242 20/1  
TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES

RECENT DEVELOPMENTS IN SONIC-BOOM  
SIMULATION USING SHOCK TUBES,

(U)

APR 73 15P GOTTLIEB, J. J. (GLASS, J.

I. ;

CONTRACT: AF-AFOSR-2274-72

PROJ: AF-9783

TASK: 978306

MONITOR: AFOSR

TR-74-0613

UNCLASSIFIED REPORT

AVAILABILITY: PUB. IN CANADIAN JNL. OF

PHYSICS, V52 N3 P207-218 1974.

SUPPLEMENTARY NOTE: TEXT IN ENGLISH; SUMMARIES IN  
ENGLISH AND FRENCH.

DESCRIPTORS: \*SONIC BOOM, \*SIMULATORS, \*SHOCK  
TUBES, STRUCTURES, GAS DYNAMICS, ACOUSTICS, WAVE  
PROPAGATION, COMMUNITY RELATIONS, CANADA  
IDENTIFIERS: PYRAMIDAL STRUCTURE

(U)

(U)

GASDYNAMIC AND ACOUSTIC ANALYSES WERE PERFORMED IN  
ORDER TO PROVIDE GREATER INSIGHT INTO THE OPERATION  
OF SONIC-BOOM SIMULATORS UTILIZING SHOCK-TUBE  
DRIVERS. THREE BASIC SHOCK TUBES WERE CONSIDERED:  
EACH HAD A PYRAMIDAL DRIVER JOINED AT THE DIAPHRAGM  
STATION TO A PYRAMIDAL CHANNEL OF THE SAME DIVERGENCE  
ANGLE (PYRAMIDAL SHOCK TUBE), OR OF A DIFFERENT  
ANGLE, OR JOINED TO A CONSTANT-AREA CHANNEL.  
CLASSICAL ACOUSTIC THEORY WAS APPLIED TO OBTAIN NEW  
ANALYTICAL SOLUTIONS TO DESCRIBE THE WAVE MOTION IN  
SUCH FACILITIES, IN AGREEMENT WITH EXPERIMENTAL DATA.  
IN ADDITION, A DETAILED STUDY OF THE NONLINEAR  
GENERATION AND PROPAGATION FEATURES OF THE N WAVE  
WAS MADE FOR THE IMPORTANT AND PRACTICAL CASE OF THE  
PYRAMIDAL SHOCK TUBE. THE WORK DESCRIBED ABOVE IS  
OF CURRENT INTEREST AS SHOCK-TUBE-TYPE FACILITIES ARE  
IN PRESENT USE IN FRANCE, GERMANY, ENGLAND, THE  
UNITED STATES, AND CANADA TO ASSESS SOCIETAL  
PROBLEMS ASSOCIATED WITH SONIC BOOM. (AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 779 151 20/1 1/3  
ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT  
PARIS (FRANCE)

NOISE MECHANISMS.

(U)

DESCRIPTIVE NOTE: CONFERENCE PROCEEDINGS NO. 131.

74 376P

REPT. NO. AGARD-CP-131

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE FLUID DYNAMICS  
PANEL SPECIALISTS' MEETING, BRUSSELS, 19-21 SEP  
73. NATO FURNISHED.

DESCRIPTORS: \*AERODYNAMIC NOISE, \*MEETINGS, JET  
ENGINES, SONIC BOOM, NOISE REDUCTION, SHOCK WAVES,  
VORTICES, PHYSIOLOGICAL EFFECTS

(U)

THIS SPECIALISTS' MEETING WAS HELD TO FOLLOW ON THE  
MEETING ON 'AIRCRAFT ENGINE NOISE AND SONIC  
BOOM', HELD JOINTLY WITH THE PROPULSION AND  
ENERGETICS PANEL IN MAY 1969. EMPHASIS ON  
THIS OCCASION WAS ON THE FUNDAMENTAL PROBLEMS OF  
NOISE GENERATION AND ATTENUATION; MAIN ASPECTS  
CONSIDERED WERE NOISE GENERATION AND DAMPING,  
COMBUSTION AND JET NOISE, SONIC BOOM THEORY AND NOISE  
DUE TO BOUNDARY AND SHEAR LAYER EFFECTS. THE  
MEETING CONCLUDED WITH A ROUND TABLE DISCUSSION. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 780 050 6/6  
FEDERAL AVIATION ADMINISTRATION WASHINGTON D C SYSTEMS  
RESEARCH AND DEVELOPMENT SERVICE

THE RESPONSE OF SONGBIRDS TO THE SEISMIC  
COMPRESSION WAVES PRECEDING SONIC BOOMS. (U)

DESCRIPTIVE NOTE: FINAL REPT.,  
MAY 74 28P HIGGINS, THOMAS H. ;  
REPT. NO. FAA-RD-74-78  
PROJ: FAA-202-554-015

UNCLASSIFIED REPORT

DESCRIPTORS: \*BIRDS, \*SONIC BOOM, \*SEISMIC WAVES,  
WILDLIFE, RESPONSE(BIOLOGY), AUDIO TAPES,  
TEST METHODS, TEST EQUIPMENT, RECORDING SYSTEMS,  
SOUND, SUPERSONIC AIRCRAFT, JET PLANE NOISE (U)  
IDENTIFIERS: \*ANIMAL BEHAVIOR, NOISE  
POLLUTION (U)

AMONG THE ENVIRONMENTAL AND OPERATIONAL PROBLEMS  
STUDIED DURING THE PROGRAM WERE THE EFFECTS OF THE  
SONIC BOOMS ON WILDLIFE. IN ADDITION TO THE  
CUSTOMARY SONIC BOOM OVERPRESSURE SIGNATURE  
MEASUREMENTS, AUDIO TYPE RECORDINGS WERE MADE AT BOTH  
OUTDOOR AND INDOOR MEASUREMENT SITES AND THESE WERE  
STUDIED IN REACTION TO THE OTHER MEASURES OBTAINED.  
ANALYSIS OF THE AUDIO TAPES DISCLOSED AN  
INTERESTING PHENOMENA. THE CONTINUOUS SONGS OF  
BIRDS OF THE FIELD WERE COMPLETELY SILENCED 4 TO 8  
SECONDS PRIOR TO THE ARRIVAL OF THE AUDIBLE SONIC  
BOOM. ADDITIONAL AUDIO RECORDINGS, MADE FOR THE  
SPECIFIC PURPOSE OF VERIFYING THIS COMPLETE SILENCE  
OF ALL SONGBIRDS 4 TO 8 SECONDS PRIOR TO THE ARRIVAL  
OF THE SONIC BOOM'S AUDIBLE REPORT AND OVERPRESSURE  
SIGNATURE MEASUREMENT, WERE IDENTICAL TO THE FIRST  
OBTAINED. FURTHER STUDY DISCLOSED THAT THIS  
RESPONSE OF SONGBIRDS COINCIDES WITH THE ARRIVAL OF  
THE SEISMIC SIGNAL PROPAGATED THROUGH THE GROUND AND  
PRECEDING THE SONIC BOOM SHOCK WAVE BY 4 TO 8  
SECONDS. (MODIFIED AUTHOR ABSTRACT) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 781 899 20/1 13/13 1/2  
ROYAL AIRCRAFT ESTABLISHMENT FARNBOROUGH (ENGLAND)

THE RESPONSE OF SOME LEADED WINDOWS TO  
SIMULATED SONIC BANGS.

(U)

DESCRIPTIVE NOTE: TECHNICAL REPT.,  
NOV 73 51P PALLANT, R. J. ;  
REPT. NO. RAE-TR-73111  
MONITOR: DRIC 9R-37827

UNCLASSIFIED REPORT

DESCRIPTORS: \*WINDOWS, \*SONIC BOOM, AERODYNAMIC  
LOADS, DAMAGE ASSESSMENT, OVERPRESSURE, SUPERSONIC  
AIRCRAFT, GREAT BRITAIN, DYNAMIC RESPONSE

(U)

AN INVESTIGATION WAS MADE INTO THE BEHAVIOR OF THE  
LEAD FRAMEWORK, OR CALMES, IN LEADED-LIGHT WINDOWS  
DUE TO REPEATED LOADINGS BY SIMULATED SONIC BANGS OF  
MODERATE AMPLITUDE. THE THRESHOLD AT WHICH DAMAGE  
OCCURS HAS ALSO BEEN ASSESSED. THIS REPORT  
DESCRIBES HOW THE TESTS WERE CARRIED OUT AND GIVES  
RESULTS OF THE MEASUREMENTS TAKEN. THE RESULTS  
INDICATE THAT SOME SMALL PERMANENT DEFLECTION OF  
LEADED LIGHTS MAY OCCUR IF THEY ARE SUBJECTED TO REAL  
SONIC BANGS OVER A LONG PERIOD. CHARACTERISTIC  
OVERPRESSURES GREATER BY A FACTOR OF 20 THAN THOSE  
PREDICTED FOR COMMERCIAL SUPERSONIC TRANSPORT  
AIRCRAFT IN THE CRUISE WILL BE REQUIRED TO PRODUCE  
EVEN A FIRST INDICATION OF DAMAGE. (MODIFIED  
AUTHOR ABSTRACT)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 804 043 1/3 20/4  
BOEING CO RENTON WASH AIRPLANE DIV

COMMERCIAL SUPERSONIC TRANSPORT PROGRAM. PHASE II-A.  
COMPREHENSIVE REPORT. VOLUME VII-A. SONIC BOOM AND  
NOISE. (U)

NOV 64 105P  
REPT. NO: D6-8680-7  
CONTRACT: FA-SS-64-4

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 5-A BOOK 2,  
AD-804 042L.

DESCRIPTORS: (•JET TRANSPORT PLANES, SUPERSONIC  
AIRCRAFT), (•AIRFRAMES, DESIGN), JET ENGINE NOISE, JET  
PLANE NOISE, SONIC BOOM, SONIC FATIGUE, AIRCRAFT CABINS,  
AIRPLANE MODELS, MODEL TESTS, SOURCES, (U)  
FATIGUE(MECHANICS) (U)  
IDENTIFIERS: SUPERSONIC TRANSPORTS

THE BOEING COMPANY HAS SUBMITTED FOR PHASE  
II-A EVALUATION AN AIRPLANE DESIGN, WHICH, IN ITS  
INTERCONTINENTAL AND DOMESTIC VERSIONS, WILL PROVIDE  
ECONOMICAL SUPERSONIC TRANSPORTS MEETING THE DIVERSE  
REQUIREMENTS OF VARIOUS OPERATORS AND ALSO MEETING  
THE DESIGN OBJECTIVES OF THE FAA. THE TWO MODELS  
OF THE AIRPLANE ARE IDENTICAL IN ALL RESPECTS EXCEPT  
FOR OPERATIONAL EMPTY WEIGHT AND MAXIMUM GROSS  
WEIGHT. BOTH THE DOMESTIC AND INTERCONTINENTAL  
VERSIONS MEET OR ARE LOWER THAN ALL NOISE OBJECTIVES  
ESTABLISHED BY THE FAA. NOTABLE PROGRESS HAS  
BEEN MADE DURING PHASE II-A TOWARD DEVELOPING A  
SUPERSONIC TRANSPORT THAT HAS BOTH INTERIOR AND  
EXTERIOR NOISE LEVELS LOWER THAN PRESENT SUBSONIC  
AIRPLANES. SIGNIFICANT CONFIGURATION CHANGES FROM  
THE PHASE I PROPOSAL THAT HAVE CONTRIBUTED TO  
IMPROVEMENT ARE: (1) DEVELOPMENT OF ENGINE INLET  
AND NOZZLE NOISE SUPPRESSION TECHNIQUES WITH NO  
PERFORMANCE PENALTY; AND (2) RELOCATION OF ENGINES  
AFT ON THE WING TO REDUCE ENGINE NOISE HEARD IN THE  
CABIN. THESE CHANGES, COUPLED WITH TEST-PROVEN  
STRUCTURAL DESIGN CONCEPTS, WILL ENSURE A 50,000-HOUR  
FATIGUE LIFE FOR THE AIRPLANE WITH MINIMUM WEIGHT  
PENALTY. THIS DOCUMENT PRESENTS THE SUBSTANTIATING  
DATA FOR SONIC BOOM, ENGINE NOISE, INTERIOR NOISE,  
AND SONIC FATIGUE EFFECT ON STRUCTURES.  
(AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 804 051 1/3  
BOEING CO RENTON WASH AIRPLANE DIV

COMMERCIAL SUPERSONIC TRANSPORT PROGRAM. PHASE II-A.  
COMPREHENSIVE REPORT. VOLUME XX-A. PARAMETRIC AND  
TRADEOFF STUDIES. (U)

NOV 64 105P  
REPT. NO. D6-8680-20  
CONTRACT: FA-SS-64-4

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 18-A, AD-804  
050L.

DESCRIPTORS: (\*JET TRANSPORT PLANES, SUPERSONIC  
AIRCRAFT), AIRFRAMES, RANGE(DISTANCE), FLIGHT SPEEDS,  
SONIC BOOM, AERODYNAMIC CONFIGURATIONS, DESIGN,  
FEASIBILITY STUDIES, JET ENGINE FUELS, OPERATION,  
COMMERCIAL PLANES, COSTS (U)  
IDENTIFIERS: SUPERSONIC TRANSPORTS, TRADEOFFS (U)

IT IS THE PURPOSE OF THIS DOCUMENT TO SHOW THE  
RESULTS OF EXTENSIVE PARAMETRIC AND TRADE STUDIES ON  
THE EFFECTS OF AIRPLANE SPEED, SIZE, AND RANGE ON  
TOTAL PURCHASE PRICE, DIRECT OPERATING COST, AND  
SONIC BOOM. THESE PARAMETRIC STUDIES WHICH COVER A  
WIDE RANGE OF EACH DESIGN VARIABLE, ARE THE BASES FOR  
SELECTION OF PROPOSED VARIABLE SWEEP SUPERSONIC  
TRANSPORT. (U)



UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 809 210 20/1  
AIR FORCE WEAPONS LAB KIRTLAND AFB N MEX

A SONIC BOOM STUDY FOR THE STRUCTURAL ENGINEER. (U)

DESCRIPTIVE NOTE: TECHNICAL REPT., 1 JUN 65-1 SEP 66,  
MAR 67 106P BAILEY, DURL I  
REPT. NO. AFWL-TR-66-154  
PROJ: AF-5713

UNCLASSIFIED REPORT

DESCRIPTORS: (\*SONIC BOOM, SUPERSONIC AIRCRAFT),  
STRUCTURAL PROPERTIES, DAMAGE ASSESSMENT, ENGINEERING,  
PRESSURE, MANEUVERABILITY, TERRAIN, METEOROLOGICAL  
PHENOMENA, MATHEMATICAL ANALYSIS, EQUATIONS, SHOCK  
WAVES, STRUCTURES, DAMAGE (U)

SONIC BOOMS GENERATE AN N-TYPE PRESSURE WAVE.  
EQUATIONS AND TABLES ARE PRESENTED FOR THE  
CALCULATION OF PEAK OVERPRESSURE FOR THE SONIC BOOM  
GENERATED BY AIRCRAFT IN STRAIGHT LEVEL FLIGHT. AN  
EQUATION IS ALSO FURNISHED FOR THE CALCULATION OF THE  
TIME DURATION OF THE SONIC BOOM PRESSURE WAVE.  
AIRCRAFT MANEUVERS, GROUND TERRAIN, AND  
METEOROLOGICAL CONDITIONS AFFECT THE PEAK  
OVERPRESSURE OF THE PRESSURE WAVE. CORRECTIONS FOR  
THESE EFFECTS CAN ONLY BE ROUGHLY ESTIMATED.  
DYNAMIC LOAD FACTORS FOR THE PRESSURE WAVES OF  
SONIC BOOMS ARE PRESENTED. THESE FACTORS MAY BE  
USED TO CALCULATE THE DYNAMIC DEFLECTION AND STRESS  
CAUSED BY A SONIC BOOM. SAMPLE CALCULATIONS OF  
DYNAMIC DEFLECTION AND STRESS FOR A BEAM, PLATE, AND  
ROOF TRUSS ARE FOUND IN APPENDIXES 3, 4, AND 5  
RESPECTIVELY. (AUTHOR) (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 816 591 14/2 20/4  
GENERAL ELECTRIC CO PHILADELPHIA PA MISSILE AND SPACE  
DIV

A SHOCK-ON-SHOCK TEST FACILITY.

(U)

DESCRIPTIVE NOTE: TECHNICAL INFORMATION SERIES,  
OCT 66 19P HARRIS, CLARENCE J. IWARREN,  
W. R. IPRIDGEN, ROBERT G. ;  
REPT. NO. R66SD56  
CONTRACT: AF 04(647)-617

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED AT THE AIAA AERODYNAMIC  
TESTING CONFERENCE, LOS ANGELES, CALIF. SEP 66,  
AS PAPER 66-764.

DESCRIPTORS: (\*SHOCK TUBES, AERODYNAMICS), (\*REENTRY  
VEHICLES, SHOCK WAVES), (\*SUPERSONIC AIRCRAFT, SHOCK  
WAVES), REFLECTION, SUPERSONIC FLIGHT, HYPERSONIC  
FLIGHT, TEST FACILITIES, PRESSURE, INTERACTIONS,  
AERODYNAMIC CHARACTERISTICS, SONIC BOOM, TRANSPORT  
PROPERTIES, NOSE CONES, HYPERSONIC CHARACTERISTICS,  
SUPERSONIC CHARACTERISTICS

(U)

IDENTIFIERS: DRIVER GASES

(U)

IN CURRENT RE-ENTRY TECHNOLOGY AS WELL AS IN  
SUPERSONIC AIRCRAFT EVALUATION STUDIES THERE IS  
INTEREST IN THE EFFECTS WHICH OCCUR WHEN A STRONG  
AERODYNAMIC WAVE TRAVERSES AND REFLECTS FROM A  
VEHICLE IN SUPERSONIC OR HYPERSONIC FLIGHT. TO  
STUDY THIS PROBLEM EXPERIMENTALLY IN THE LABORATORY  
AN EXISTING COMBUSTION DRIVER SHOCK TUNNEL HAS BEEN  
CONVERTED INTO A HEATED BLOW DOWN WIND TUNNEL -  
NORMAL BLAST WAVE GENERATOR SHOCK-ON-SHOCK TEST  
FACILITY. THIS FACILITY HAS BEEN USED TO OBTAIN  
SHOCK INTERACTION SURFACE PRESSURE DATA ON STING  
MOUNTED AND WIRE SUPPORTED MODELS. THE TEST  
FACILITY CONFIGURATION AND THE APPROACH USED PRESENT  
UNIQUE OPERATIONAL FEATURES. THIS PAPER REPORTS ON  
THE BASIC FACILITY DESIGN APPROACHES AND CONCEPTS  
CONSIDERED, THE ACTUAL CONVERSION OF THE SHOCK TUNNEL  
INTO A SHOCK-ON-SHOCK TEST FACILITY, AND THE  
RESULTING PERFORMANCE OF THIS FACILITY. ALSO  
PRESENTED ARE SHOCK-ON-SHOCK MODEL SURFACE TRANSIENT  
PRESSURE RESULTS OBTAINED USING THIS FACILITY.  
(AUTHOR)

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD- 900 405 20/1 1/3 12/1 9/2  
WYLE LABS EL SEGUNDO CALIF

PREDICTION METHODS FOR NEAR FIELD NOISE  
ENVIRONMENTS OF VTOL AIRCRAFT.

(U)

DESCRIPTIVE NOTE: FINAL REPT. FEB 69-OCT 71,  
MAY 72 244P SUTHERLAND, LOUIS C. BROWN,

DAVID ;

REPT. NO. WR-71-19

CONTRACT: F33615-69-C-1407

PROJ: AF-1471

TASK: 147102

MONITOR: AFFDL

TR-71-180

UNCLASSIFIED REPORT

DESCRIPTORS: (\*VERTICAL TAKEOFF AIRCRAFT, \*AIRCRAFT  
NOISE), (\*NOISE, MATHEMATICAL PREDICTION),  
(\*MATHEMATICAL MODELS, NOISE), AIRPLANE ENGINE NOISE,  
JET ENGINE NOISE, JET PLANE NOISE, PROPELLER NOISE,  
AERODYNAMIC NOISE, WHITE NOISE, SONIC BOOM, AIRCRAFT  
LANDINGS, TAKEOFF, FATIGUE (MECHANICS), AIRFRAMES,  
VIBRATION, GROUND EFFECT, SOUND TRANSMISSION,  
REFLECTIVITY, FREQUENCY, BUFFETING, ROTOR BLADES (ROTARY  
WINGS), REDUCTION, INTENSITY, ACOUSTIC PROPERTIES, GAS  
FLOW, SHOCK WAVES, TURBULENCE, VORTICES, GAS TURBINES,  
WALLS, FANS, JETS, POWER SPECTRA, AERODYNAMIC LOADING,  
LIFT, BLADE AIRFOILS, ANECHOIC CHAMBERS, COMPUTER  
PROGRAMS, JET AIRCRAFT, HELICOPTERS, BIBLIOGRAPHIES (U)  
IDENTIFIERS: J-57 ENGINES, J-57-P-21 ENGINES, NEAR  
FIELD NOISE, SOUND CONTOURS, STORED ROTORS (U)

THIS REPORT ESTABLISHES A CONSISTENT SET OF  
PREDICTION METHODS WHICH MAY BE USED TO ESTIMATE NEAR  
FIELD NOISE LEVELS FOR JET POWERED AND ROTOR/  
PROPELLER POWERED VTOL AIRCRAFT OPERATING IN CLOSE  
PROXIMITY TO THE GROUND. THE METHODS PROVIDED  
UTILIZE AVAILABLE THEORY AUGMENTED EXTENSIVELY BY  
EXPERIMENTAL DATA WHICH WAS AVAILABLE OR WAS OBTAINED  
DURING THE PROGRAM. THE NOISE PREDICTION METHODS  
PRESENTED WILL ALLOW AN ANALYSIS OF NEAR FIELD  
ENVIRONMENTS OF VTOL AIRCRAFT USING A SIMPLIFIED  
PROCEDURE SUITABLE FOR MANUAL CALCULATIONS. THE  
EXPERIMENTAL EFFORT CARRIED OUT IN THE PROGRAM  
CONSISTED OF NOISE MEASUREMENTS IN THE NEAR FIELD OF  
A MODEL PROPELLER AND A SUBSONIC JET IN A FREE AND  
VERTICAL CONFIGURATION. GROUND REFLECTION  
CORRECTION FACTORS FOR A SIMPLE SOURCE ARE TABULATED  
ALONG WITH THE COMPUTER PROGRAM LISTING.

(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD-A002 266 5/10 20/1  
FEDERAL AVIATION ADMINISTRATION WASHINGTON D C OFFICE OF  
AVIATION MEDICINE

BEHAVIORAL, AUTOMATIC, AND SUBJECTIVE  
REACTIONS TO LOW- AND MODERATE-LEVEL  
SIMULATED SONIC BOOMS: A REPORT OF TWO  
EXPERIMENTS AND A GENERAL EVALUATION OF SONIC  
BOOM STARTLE EFFECTS, (U)

SEP 74 15P THACKRAY, RICHARD I. ;  
TOUCHSTONE, R. MARK ; BAILEY, JOE P. ;  
REPT. NO. FAA-AM-74-9  
PROJ: FAA-AM-E-74-PSY-47, FAA-AM-E-75-PSY-47

UNCLASSIFIED REPORT

DESCRIPTORS: \*SONIC BOOM, \*STRESS (PSYCHOLOGY),  
\*PSYCHOLOGICAL TESTS, SIMULATION, INTENSITY,  
RESPONSE, NOISE POLLUTION, EYE (U)  
IDENTIFIERS: \*STARTLE EFFECTS, ANNOYANCE,  
EYEBLINK (U)

TWO SEPARATE STUDIES ARE REPORTED. THE FIRST  
ATTEMPTED TO DETERMINE A SONIC BOOM EXPOSURE LEVEL  
BELOW WHICH STARTLE REACTIONS WOULD NOT OCCUR.  
SUBJECTS WERE EXPOSED INDOORS TO SIX SIMULATED  
SONIC BOOMS HAVING VARIOUS OUTSIDE OVERPRESSURES.  
IN THE SECOND STUDY, SUBJECTS WERE EXPOSED INDOORS  
TO A SERIES OF 12 SIMULATED BOOMS IN ORDER TO ASSESS  
HABITUAL EFFECTS. AUTOMATIC AND EYEBLINK  
RESPONSES, AS WELL AS RATINGS OF SUBJECTIVE  
ANNOYANCE, WERE OBTAINED IN BOTH STUDIES. THE FINAL  
SECTION OF THE REPORT SUMMARIZES THE EXPECTED  
BEHAVIORAL, AUTONOMIC, AND SUBJECTIVE EFFECTS OF  
EXPOSURE TO VARIOUS LEVELS OF SONIC BOOMS. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOMD9

AD-A005 986 6/3  
ALABAMA COOPERATIVE WILDLIFE RESEARCH UNIT AUBURN

THE EFFECT OF SONIC BOOM ON THE NESTING AND  
BROOD REARING BEHAVIOR OF THE EASTERN WILD  
TURKEY.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,  
JAN 75 45P LYNCH, THOMAS E. ; SPEAKE,  
DAN W. ;  
MONITOR: FAA-RD 75-2

UNCLASSIFIED REPORT

DESCRIPTORS: •TURKEYS, •SONIC BOOM,  
•STRESS(PHYSIOLOGY), REACTION(PSYCHOLOGY),  
REPRODUCTION(PHYSIOLOGY), BEHAVIOR, TEST  
METHODS, WILDLIFE  
IDENTIFIERS: DOT/5B, DOT/5I

(U)

(U)

TWENTY WILD TURKEY HENS WERE CAPTURED AND EQUIPPED  
WITH 164 MHZ TRANSMITTERS. THE NEST SITES OF  
EIGHT HENS WERE SUCCESSFULLY LOCATED BY TELEMETRIC  
TRIANGULATION AND FOUR OF THESE WERE SUBJECTED TO  
BOTH REAL AND SIMULATED SONIC BOOMS. HENS WITH  
YOUNG WERE ALSO LOCATED BUT WERE SUBJECTED TO  
SIMULATED SONIC BOOMS ONLY. SONIC BOOMS DID NOT  
INITIATE ANY ABNORMAL BEHAVIOR IN WILD  
TURKEYS THAT WOULD RESULT IN DECREASED PRODUCTIVITY.(U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD-A007 205 20/1  
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

THE SONIC BOOM, (U)

FEB 75 36P ZHILIN, YU. L. ;  
REPT. NO. FTD-MT-24-0565-75

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: WORKING COPY MACHINE TRANS. OF  
TSENTHALNYI AEROGIDRODINAMICHESKII INSTITUT. UCHENYE  
ZAPISKI (USSR) V2 N3 P1-11 1971.

DESCRIPTORS: \*SONIC BOOM, \*SUPERSONIC FLIGHT,  
\*ACOUSTIC FIELDS, AIRCRAFT NOISE, MATHEMATICAL  
MODELS, SHOCK WAVES, EQUATIONS, ATMOSPHERIC  
PHYSICS, TRANSLATIONS, USSR (U)

THE SONIC BOOM--TRANSLATION.

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD-A009 296 5/10 20/1 1/3  
GENERAL APPLIED SCIENCE LABS INC WESTBURY N Y

PSYCHOPHYSICAL TESTS OF POTENTIAL DESIGN/  
CERTIFICATION CRITERIA FOR ADVANCED  
SUPERSONIC AIRCRAFT.

(U)

DESCRIPTIVE NOTE: FINAL REPT.,  
FEB 75 83P HIGGINS, THOMAS H. I  
SANLORENZO, ERNEST A. I  
REPT. NO. GASL-TR-789  
CONTRACT: DOT-FA73WA-3203  
MONITOR: FAA-RD 75-10

UNCLASSIFIED REPORT

DESCRIPTORS: \*SUPERSONIC AIRCRAFT, \*SONIC BOOM,  
\*PSYCHOACOUSTICS, SONIC FATIGUE, JET ENGINE NOISE,  
ACOUSTIC SIGNATURES, ACOUSTIC MEASUREMENT,  
RESPONSE(BIOLOGY), NOISE POLLUTION  
IDENTIFIERS: DOT/40Z/DA, DOT/5B

(U)

(U)

A SUBJECTIVE VALUATION OF SIMULATED SONIC BOOMS  
HEARD INDOORS AND OUTDOORS HAS BEEN CARRIED OUT TO  
ASSESS THE VALIDITY OF A SIMPLE FORMULATION FOR  
ESTIMATING PERCEIVED NOISE LEVELS. USING A  
PSYCHOACOUSTIC EXPERIMENT DESIGN BASED ON MAGNITUDE  
ESTIMATION OF THE PERCEIVED LEVEL, IT WAS SHOWN THAT  
THE SUBJECTIVE RESPONSE WAS CONSISTENT WITH THE  
PREDICTIONS OF BOTH THE SIMPLE FORMULA FOR PLDB  
AS WELL AS PLDB DETERMINED FROM AN ANALYSIS OF  
THE SONIC BOOM STIMULI USING THE MARK 7 PROCEDURE. (U)

UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD-A009 656 20/1 1/3  
MAN-ACOUSTICS AND NOISE INC SEATTLE WASH

ESTABLISHING CERTIFICATION/DESIGN CRITERIA  
FOR ADVANCED SUPERSONIC AIRCRAFT UTILIZING  
ACCEPTANCE, INTERFERENCE, AND ANNOYANCE  
RESPONSE TO SIMULATED SONIC BOOMS BY  
PERSONS IN THEIR HOMES. (U)

DESCRIPTIVE NOTE: FINAL REPT.,  
MAR 73 101P MABRY, J. E. MONCLEY, P.  
B. I  
REPT. NO. MAN-1010  
CONTRACT: DOT-FA74WAI-444  
MONITOR: FAA-RD 75-44

UNCLASSIFIED REPORT

DESCRIPTORS: \*SONIC BOOM, \*COMMERCIAL AIRCRAFT,  
\*SUPERSONIC TRANSPORTS, SIMULATION, COMMUNITIES,  
NOISE POLLUTION, SURVEYS, RESIDENTIAL SECTION,  
ACCEPTABILITY, THRESHOLD EFFECTS,  
STRESS (PSYCHOLOGY), NOISE REDUCTION,  
STANDARDS (U)  
IDENTIFIERS: DOT/5B, DOT/402/DA (U)

TWO MAIN OBJECTIVES OF THE STUDY WERE: (1)  
TO ESTABLISH A THRESHOLD OF ACCEPTABILITY FOR  
COMMERCIAL AIRCRAFT SONIC BOOMS, (2) TO  
INVESTIGATE AND DEVELOPE THE TECHNOLOGY TO PROVIDE  
SIMULATION TO ANY COMMUNITY NOISE PROBLEM. SEVEN  
COMMUNITY NOISE SIMULATION SYSTEMS WERE  
DESIGNED AND FABRICATED, AND SIMULATED SONIC BOOMS  
WERE INTRODUCED, VIA THESE SYSTEMS, INTO THE HOMES OF  
TWELVE SUBJECT FAMILIES. ACCEPTANCE, INTERFERENCE,  
AND ANNOYANCE RESPONSE DATA WERE MEASURED. THREE  
BOOM LEVELS AND TWO FREQUENCY SCHEDULES WERE STUDIED.  
IT WAS CONCLUDED THAT FOR ESTABLISHING A DESIGN/  
CERTIFICATION SONIC BOOM THRESHOLD OF ACCEPTABILITY  
FOR ADVANCED SUPERSONIC TRANSPORTS, A LEVEL OF 87  
DB SHOULD BE CONSIDERED FOR INDOOR LIVING WITH NOT  
MORE THAN FIFTEEN DAILY BOOM EXPOSURES (NO  
NIGHTTIME BOOMS). IT WAS ALSO CONCLUDED THAT THE  
SIMULATION DEVELOPED CAN BE USED TO ESTABLISH  
STANDARDS INVOLVING TRAFFIC NOISE, NOISE FROM  
AIRPORTS, CONSTRUCTION NOISE, AND EFFECTS OF  
INDUSTRIAL NOISE ON SURROUNDING COMMUNITIES. (U)



UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD-A009 663 20/1 5/10 1/3 6/19  
H M AEROSPACE DESIGN CO ELMSFORD N Y

SURVEY OF SONIC BOOM PHENOMENA FOR THE NON-  
SPECIALIST.

(U)

DESCRIPTIVE NOTE: FINAL REPT. JUN 74-FEB 75,  
FEB 75 106P SLUTSKY, SIMON I  
REPT. NO. HHA-14  
CONTRACT: DOT-FA74WAI-468  
MONITOR: FAA-RD 75-68

UNCLASSIFIED REPORT

DESCRIPTORS: \*STRESS(PHYSIOLOGY), \*SONIC BOOM,  
\*ENVIRONMENTS, ANIMALS, SUPERSONIC AIRCRAFT,  
ACOUSTIC WAVES, WAVE PROPAGATION, PHYSIOLOGICAL  
EFFECTS, RESPONSE(BIOLOGY), STRUCTURAL  
RESPONSE

(U)

IDENTIFIERS: DOT/40Z/DA, DOT/5B

(U)

THE PURPOSE OF THIS DOCUMENT IS TO MAKE AVAILABLE  
TO THE NON-SPECIALIST AND NON-SCIENTIST A REVIEW OF  
THE TECHNICAL CONCEPTS UNDERLYING THE WORK DONE IN  
THE FIELD OF SONIC BOOM RESEARCH. IT CONTAINS A  
NON-TECHNICAL DISCUSSION OF THE ACOUSTIC MECHANISMS  
WHICH ARE FUNDAMENTAL IN SONIC BOOM PHENOMENA, USING  
PHOTOGRAPHS OF WATER WAVE ANALOGUES. THEN THE  
REPORT DISCUSSES A VARIETY OF BASIC ASPECTS  
INCLUDING: GENERATION, PROPAGATION, MINIMIZATION,  
HUMAN RESPONSE AND SOCIAL CRITERIA, STRUCTURAL AND  
WILDLIFE RESPONSE, THRESHOLD MACH NUMBER OPERATIONS  
AND SIMULATION METHODS. THE REPORT SITES MANY  
REFERENCES AND DRAWS EXTENSIVELY ON A RECENT REVIEW  
FOR INVESTIGATORS IN THE FIELD OF SONIC BOOM PREPARED  
BY L. J. RUNYAN AND E. J. KANE.

(U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZOM09

AD-A010 488 20/1 20/4  
TORONTO UNIV (ONTARIO) INST FOR AEROSPACE STUDIES

SIMULATION OF A TRAVELLING SONIC BOOM IN A  
PYRAMIDAL HORN.

(U)

DESCRIPTIVE NOTE: INTERIM REPT.,  
JUL 74 231P GOTTLIEB, JAMES JOSEPH ;  
REPT. NO. UTIAS-196  
CONTRACT: AF-AFOSR-2274-72  
PROJ: AF-9783  
MONITOR: AFOSR TR-75-0711

UNCLASSIFIED REPORT

DESCRIPTORS: \*SONIC BOOM, \*ACOUSTIC WAVES,  
\*ACOUSTIC HORNS, SIMULATORS, SHOCK TUBES, SHOCK  
WAVES, MASS FLOW, FLOW RATE, CANADA

(U)

IN ORDER TO ASSESS CURRENT SOCIETAL PROBLEM  
ASSOCIATED WITH THE SONIC BOOM, A HORN-TYPE SIMULATOR  
WAS CONSTRUCTED AT THE INSTITUTE FOR AEROSPACE  
STUDIES, UNIVERSITY OF TORONTO (UTIAS).  
THE SIMULATOR HORN IS IN THE FORM OF A HORIZONTAL  
CONCRETE PYRAMID, WHICH IS 25 M LONG AND HAS 3-M-  
SQUARE BASE. AT ITS APEX A SPECIALLY-DESIGNED  
VALVE IS USED TO CONTROL THE MASS-FLOW RATE OF AIR  
FROM A HIGH-PRESSURE RESERVOIR INTO THE HORN WHERE  
THE FLOW GENERATES A SIMULATED SONIC BOOM OR  
TRAVELLING N-WAVE OF SUITABLE AMPLITUDE AND  
DURATION, AND ACCEPTABLY-SHORT RISE TIME.  
ALTERNATIVELY, A SHOCK-TUBE DRIVER CAN BE INSTALLED  
AT THE APEX AND USED FOR GENERATING SHORT-DURATION  
AND RAPID RISE-TIME SONIC BOOMS. FOR THE MASS-FLOW  
VALVE MODE OF OPERATION OF HIGH-FREQUENCY SOUND  
ABSORBER CAN BE INSTALLED NEAR THE APEX OF THE HORN  
TO FILTER OUT OF THE PASSING N-WAVE UNDESIRABLE JET  
NOISE THAT IS PRODUCED BY THE HIGH-SPEED TURBULENT  
FLOW AT THE VALVE.

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DDC REPORT BIBLIOGRAPHY    SEARCH CONTROL NO. /ZOM09

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ADVISORY GROUP FOR AEROSPACE RESEARCH AND DEVELOPMENT  
PARIS (FRANCE)

AIRCRAFT NOISE GENERATION, EMISSION AND  
REDUCTION.

(U)

DESCRIPTIVE NOTE: LECTURE SERIES.

JUN 75 187P  
REPT. NO. AGARD-LS-77

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PRESENTED IN BELGIUM 16-17 JUN 75,  
WEST GERMANY 19-20 JUN 75, AND IN THE UNITED  
KINGDOM 23-24 JUN 75. NATO FURNISHED.

DESCRIPTORS: \*JET AIRCRAFT, \*AIRCRAFT NOISE, JET  
ENGINE NOISE, PROPELLER NOISE, SONIC BOOM, NOISE  
REDUCTION, PHYSIOLOGICAL EFFECTS, LEGISLATION,  
NATO

(U)

IDENTIFIERS: \*NOISE SOURCES, \*NOISE ABATEMENT

(U)

THE PHYSICAL PROPERTIES OF AIRCRAFT NOISE ARE  
SUMMARIZED, WITH SPECIAL EMPHASIS ON JET NOISE AND  
FAN-COMPRESSOR-PROPELLER-ROTOR NOISE. TOPICS  
INCLUDE ACOUSTIC FUNDAMENTALS, NOISE SOURCE  
CHARACTERISTICS AND INTERACTIONS, ATMOSPHERIC  
PROPAGATION, AIRFRAME NOISE, SONIC BOOM, DUCT LINER  
AND MUFFLER THEORY. DURING THE SERIES, RESEARCH  
AND TECHNOLOGY ACTIVITIES RELATED TO JET ENGINE NOISE  
AND ITS CONTROL ARE DISCUSSED, AND THE IMPACT OF THIS  
NOISE ON PEOPLE AND COMMUNITIES AND AIRCRAFT  
OPERATIONAL PROCEDURES FOR NOISE MINIMISATION ARE  
ALSO REVIEWED.

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TEST AND EVALUATION OF A REAL-TIME  
SIMULATED TRANSCONTINENTAL SUPERSONIC  
BOOMLESS FLIGHT SYSTEM. VOLUME I. MAIN  
TEXT AND APPENDIX A. (U)

DESCRIPTIVE NOTE: FINAL REPT. 16 NOV 73-19 NOV 74,  
APR 75 235P BUNDGAARD, ROBERT C. I  
CONTRACT: DOT-FA74WA-3363  
MONITOR: FAA-RD 75-131-1

UNCLASSIFIED REPORT

DESCRIPTORS: \*SUPERSONIC AIRCRAFT, \*SUPERSONIC  
FLIGHT, SONIC BOOM, METEOROLOGICAL DATA,  
COMMUNICATIONS NETWORKS, WEATHER FORECASTING,  
COMPUTER GRAPHICS, COMPUTER PROGRAMS (U)  
IDENTIFIERS: \*TRANSCONTINENTAL FLIGHTS, \*BOOMLESS  
SUPERSONIC FLIGHT, DOT/40Z/DA, DOT/41Z/  
1A (U)

IN THE INVESTIGATION REPORTED, NUMERICAL METHODS  
SIMULATED SUPERSONIC FLIGHT CARRIED OUT IN REAL-TIME  
AND CONCURRENTLY AT PRESENT TIME. A COMPUTER  
PROGRAM IDENTIFIES, ACQUIRES, ANALYZES AND PREDICTS  
THE INFORMATION NEEDED IN ORDER TO PLAN, FLY AND  
VERIFY BOOMLESS FLIGHT. IT OPTIMIZES THE CUT-OFF  
MACH TIME-GAIN IN TRADE-OFF ALONG WITH OTHER  
PERTINENT NECESSARY CONSIDERATIONS NOW BEING  
REGULARLY CARRIED OUT IN THE ADVANCED AIR OPERATIONS  
OF TODAY. FOR COMMUNICATION INFORMATION IN CURRENT  
REAL-TIME FOR BOOMLESS TRANSCONTINENTAL FLIGHTS, THE  
INVESTIGATION UTILIZED NATIONWIDE NETWORKS:  
ARINC, UNINET. THE PROGRAM FORESEES THE FUTURE  
CONDITIONS AFFECTING THE CUT-OFF MACH FLIGHT  
PERFORMANCE IN SUFFICIENT TIME FOR CARRYING OUT  
RELIABLE PREFLIGHT PLANNING AND FOR MONITORING THE  
IN-FLIGHT MODIFICATIONS JUST AHEAD OF THE AIRCRAFT,  
UTILIZING THE APPROPRIATE PREDICTION OF ATMOSPHERIC  
CONDITIONS (BOOM-AHEAD COMPUTER). (U)

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AD-A028 512 1/3 20/1 1/2  
BOOZ-ALLEN APPLIED RESEARCH INC BETHESDA MD

STATISTICAL MODEL OF SONIC BOOM STRUCTURAL  
DAMAGE.

(U)

DESCRIPTIVE NOTE: FINAL REPT.:  
JUL 76 142P HERSHEY, ROBERT L. HIGGINS,  
THOMAS H. I  
CONTRACT: DOT-FA72WA-2823  
MONITOR: FAA-RD 76-87

UNCLASSIFIED REPORT

DESCRIPTORS: \*SONIC BOOM, \*DAMAGE ASSESSMENT,  
STRUCTURAL RESPONSE, AIRCRAFT NOISE, GLASS,  
WINDOWS, BRICK, OVERPRESSURE

(U)

THE PROBABILITIES OF STRUCTURAL DAMAGE FROM SONIC  
BOOMS WERE ESTIMATED FOR VARIOUS SUSCEPTIBLE  
STRUCTURAL ELEMENTS USING A STATISTICAL MODELING  
TECHNIQUE. THE BREAKAGE PROBABILITIES WERE FOUND  
TO VARY WIDELY WITH THE SPECIFIC MATERIAL  
CONFIGURATION, BUT TO CONSISTENTLY INCREASE WITH  
INCREASING NOMINAL OVERPRESSURES. THE RANGES OF  
BREAKAGE PROBABILITIES AT A NOMINAL OVERPRESSURE OF 1  
PSF FOR TYPICAL CONFIGURATIONS OF SUSCEPTIBLE  
MATERIALS WERE AS FOLLOWS: WINDOWS--.000004 TO  
.00000003, PLASTER--.0003 TO .0000005, BRICK--  
.000001 TO .00000001, BRICK WALLS--.0000006 TO  
.000000001. THE RESULTS OF THE MODELING TEND TO  
AGREE WELL WITH SONIC BOOM CLAIMS EXPERIENCE.

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CORPORATE AUTHOR - MONITORING AGENCY

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WILDLIFE SEATTLE WASH WESTERN FISH  
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